Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I Hatch **Scenario No.:** 8-01 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 60% RTP. RFPT '2A' operating at 2100 rpm.

Turnover: Continue startup and place the RFPT '2A' in service, starting at step 7.1.11.2.10 of 34SO-N21-007-2. After RFPT '2A' startup, increase reactor power to 75% RTP IAW 34GO-OPS-005-2.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Continue startup and place the RFPT '2A' in service, starting at step 7.1.11.2.10 of 34SO-N21-007-2.
2		R (ATC)	Increase reactor power via Recirc to 75% RTP.
3	mfP42_71A mfP42_72C loP42-C001AA3 loP42-C001AG1 loP42-C001AR2 ET-53	C (ATC)	RBCCW Pump '2A' (simulate sheared shaft) Standby RBCCW pump fails to start (manually started)
4	mf60111061 aoE21R600B loE21-F004BG1 loE21-F004BR2	C (BOP) TS (SRO)	2B Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004B is reopened, the valve breaker trips when control switch placed to open.
5	mf60311338	C (ATC)	RFPT '2B' receives Trouble alarm from high vibration but does NOT trip. ATC manually trips RFPT '2B'.
6	mfE41_103	I (BOP) TS (SRO)	HPCI Inadvertent Initiation. (Critical Task)
7	mf65702209 mf65702227 mfG31_242	M (ALL)	Earthquake requiring SCRAM prior to 98" in Torus. A leak in the Drywell requiring Torus Sprays. #1 & #3 Bypass valves fail closed.
8	diE11-F027A diE11-F027B ET-E11-1 ET-E11-2	C (ATC)	RHR 2E11-F027A or B RHR Torus Spray or Test Valve failed closed.
9		M (ALL)	Unisolable Torus leak worsens and Emergency Depress prior to 98" in Torus. (Critical Task)
*	(N)ormal,	(R)eactivity,	(I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 1

Event Description: Continue startup and place the RFPT '2A' in service, starting at step 7.1.11.2.10 of 34SO-N21-007-2.

Time	Position	Applicant's Actions or Behavior
15 Mins	SRO	Orders Operator to place RFPT '2A' in service, starting at step 7.1.11.2.10 of 34SO-N21-007-2.
	BOP	• Enters 34SO-N21-007-2 at step 7.1.11.2.10.
		• Confirms M/A station is tracking actual Speed Setter (RFPT) speed • Places the TMR Mode switch to M/A • Confirms the M/A Station green light illuminates
		NOTE: *34SO-N21-007-2, NOTE just above 7.1.11.2.13 allows operator to monitor the input signal using the in-service RFP M/A Station with the PF lamp 'OFF' rather than the incoming RFP M/A Station PF lamp.*

		• Slowly changes the RFPT 2A M/A station to match RFP 2A AND the RFP 2B flow match.
		• Matches the input AND output of Pump A M/A Station by performing the following:
		  • Depresses the PF key AND read the controller output (PF lamp lit)
		  • Depresses the PF key so the input to the controller is displayed (PF lamp is off)
		  • Adjusts the manual output lever until the input AND output are matched on P603 panel.
		• Monitors RWL, RFPT 2A discharge pressure and RFPT 2A & 2B speed.

		RFP C005A DISCH FLOW LOW, (656-039) will clear when RFPT 2A is placed into service. HEATER TROUBLE, (650-135) may come in and clear. This is expected for this plant condition.
		• Places RFP A M/A station in AUTO • As required, adjusts RFP A Speed Control Bias Setting to maintain RFPT 2A and 2B speed within 100 RPM. • Informs SRO that the 2A RFPT is in service in Automatic control.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 1

Event Description: Continue startup and place the RFPT '2A' in service, starting at step 7.1.11.2.10 of 34SO-N21-007-2.

Time	Position	Applicant's Actions or Behavior
	SRO	• Informs ATC to increase power with Recirc to 75% power.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 2 Page 4 of 27

Event Description: Raise reactor power to approximately 75%

Time	Position	Applicant's Actions or Behavior
10 min	SRO	• Directs ATC to increase reactor power to 75% by increasing Recirc flow. Power increases should be made as recommended by the STA/Reactor Engineering at a rate NOT to exceed 10 MWe/min.
	ATC	• Increases reactor power with Recirc flow IAW 34GO-OPS-005-2 and 34SO-B31-001-2 by depressing either the Master Recirc Flow Control raise pushbuttons or the individual pump Speed Control raise pushbuttons. • Monitors power increase by observing APRM and generator output indications.
	ATC	• Complies with 34SO-B31-001-2 , Limitation 5.2.15, which states: WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits: • <10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow; AND • <5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow.
		May get the (603-202) "RBM Upscale" and (603-238) "Rod Out Block" alarm, if a peripheral control rod is NOT selected. This is expected and the operator may select a peripheral rod at this time. *May also get Alarm 650-135, "Heater Trouble" alarm. This is expected at this power level.*
		Simulator Operator enters the next event after power has been increased by 5% or at the Chief Examiner's request

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 3 Page 5 of 27

Event Description: RBCCW Pump '2A' (simulate sheared shaft) Standby RBCCW pump fails to start (manually started)

Time	Position	Applicant's Actions or Behavior
10 Min		*At the Chief Examiner's direction, Simulator operator, INSTRUCT the BOP operator by phone to stay on the line until told to hang up. THEN ENTER: (**RB-2**)* • *mfP42_71A* • *mfP42_72C, loP42_C001AR2 (On), loP42_C001AG1 (Off), loP42_C001AA3 (Off)*
	ATC	• Responds to RBCCW PUMP DISCH PRESS LOW, (650-239).
	ATC	• Acknowledges the alarms and informs the SRO that the RBCCW system pressure is low and that the "2C" RBCCW pump did NOT auto start. (2C RBCCW may be started manually prior to recognizing failure to auto start.) (There is NOT an obvious reason for the pressure being low.)

	ATC	• Manually starts the "2C" RBCCW pump per RBCCW PUMP DISCH PRESS LOW, (650-239), 34AB-P42-001-2, "Loss of RBCCW" or 34SO-P42-001-2, RBCCW System. (May NOT pull procedures until after the pump has been started.
		• Monitors for increasing system pressure (>90psig).
		• Dispatches SO/Maint to investigate the cause of the RBCCW Low system pressure with 2 pumps running:
		  • check valve alignments IAW 34SO-P42-001-2
		  • check RBCCW loads for leakage
		  • vent system via 2P42-FV005

	SRO	• Confirms/sends SO/Maint to investigate RBCCW Low system pressure.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 3 Page 6 of 27

Event Description: RBCCW Pump '2A' (simulate sheared shaft) Standby RBCCW pump fails to start (manually started)

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator: ENSURE EVENT TRIGGER **ET-53** is ACTIVATED, THEN* *After 3 minutes of being sent to investigate the RBCCW system low pressure AND after the ATC has started 2C RBCCW pump, report that the "2A" RBCCW pump impeller and motor are NOT coupled.*
	ATC	• Reports to SRO that the "2A" RBCCW pump impeller and motor are NOT coupled.
	SRO	• Directs the operator to place the RBCCW Pump "2A" pump to PTL "Stop".
	ATC	• Places 2P42-C001A control switch to PTL "Stop" position and reports this to the SRO.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 4 Page 7 of 27

Event Description: 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004B is reopened, the valve breaker trips when control switch placed to open.

Time	Position	Applicant's Actions or Behavior
8 Mins		*At the Chief Examiner's direction, Simulator Operator ENTERS (**RB-3**) malfunction mf60111061 Window 25 Core Spray B Disch Pipe Press High (ON) and aoE21-R600B to 465 psig. ENSURE Event Trigger **E21-5** activates when 2E21-F004B is placed to open position.*

	BOP	• Enters CORE SPRAY B DISCH PIPE PRESS HIGH, (601-125)
		• Confirm validity of alarm using Disch Press indicator, 2E21-R600B (~465 psig)
		• Confirm the following valves are CLOSED
		  • 2E21-F037B, Testable Check Bypass Vlv
		  • 2E21-F005B, Inbd Discharge Vlv
		• Closes 2E21-F004B, Outbd Discharge Vlv
		• Opens 2E21-F005B
		• Closes 2E21-F005B, to reseat
		• Places 2E21-F004B to open and, CORE SPRAY SYSTEM II VALVES OVERLOAD, (601-113) is received.
		• Notifies SRO of CORE SPRAY SYSTEM II VALVES OVERLOAD, (601-113) and that the lights for 2E21-F004B are extinguished.
		• May inform SRO of TS 3.5.1 & TS 3.6.1.3

	SRO	• Directs operator to enter CORE SPRAY SYSTEM II VALVES OVERLOAD, (601-113) • Reviews TS 3.5.1 • Reviews TS 3.6.1.3
	BOP	• Enters CORE SPRAY SYSTEM II VALVES OVERLOAD, (601-113) • Dispatches SO/Maint. to reset the thermal overload for 2E21-F004B at MCC 2R24-S012, Frame 13B

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 4 Page 8 of 27

Event Description: 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When 2E21-F004B is reopened, the valve breaker trips when control switch placed to open.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, wait 4 minutes, then as an SO, report that the breaker for 2E21-F004B will NOT reset. *If asked/directed to manually break 2E21-F004B off the closed seat, report this valve will NOT move with the handwheel.*
	SRO	Enters TS 3.5.1, ECCS Operating, and determines: TS 3.5.1.A requires the ECCS pump to restored to operable status in 7 days TS 3.6.1.3.D requires the leakage to be restored within 4 hours. (2E21-F005B is a PCIV and the SRO may enter for exceeding leakage thru this valve)
		NOTE: *If addressed, 2E21-F004B is NOT a PCIV and TS 3.6.1.3 for PCIVs is NOT applicable.*
		Simulator Operator, ENSURE Event Trigger ***E21-6*** *activates when 2E21-F015B is placed to open position. This will clear CS B Disch Press High alarm & return 2E21-R600B to normal.*

	BOP	• IAW CORE SPRAY B DISCH PIPE PRESS HIGH, (601-125), may perform the following:
		  • Slightly opens 2E21-F015B to lower CS Discharge pressure
		  • Confirms CORE SPRAY B DISCH PIPE PRESS HIGH, (601-125) clears
		  • When pressure is approximately 100 psig, closes 2E21-F015B.
		  • If 601-114, CORE SPRAY B JOCKEY PUMP SYS WATER LEVEL LOW, (601-114), is received directs an SO to vent the "B" Loop of Core Spray IAW 34SV-SUV-017-2.
		  • Monitors Core Spray B Loop pressure for subsequent increases.

		NOTE: *If pressure is NOT relieved, then a follow-up question on PCIV leakage TS 3.6.1.3.D may be appropriate.*
		NOTE: *If pressure IS relieved on Core Spray Loop B, and pressure is NOT monitored, then a follow-up question on a high pressure condition of the inner system piping may be appropriate.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 5

Event Description: RFPT '2B' receives Trouble alarm from high vibration but does NOT trip. ATC manually trips RFPT '2B'.

Time	Position	Applicant's Actions or Behavior
5 Min.		*SIMULATOR OPERATOR: At the direction of the Chief Examiner, ACTIVATE mf60311338 (**RB-4**) RFPT Controller Trouble (Annunciator On).*
	ATC	Receives annunciator, RFPT CONTROLLER TROUBLE, (603-150)
	ATC	Responds to annunciator, RFPT CONTROLLER TROUBLE, (603-150): • Dispatches an SO to report local vibration on 2H21-P536, TMR Workstation Mark V Control Panel.
		SIMULATOR OPERATOR: When contacted by the ATC, as the System Engineer, tell the operator you will look into the RFPT vibration and get back to the operator. *As the SO, wait 2 minutes after being dispatched and then ONLY report that 2B RFPT vibrations are 8 mils and increasing slowly.*
	ATC	Enters 34SO-N21-007-2, subsection 7.3.43, RFPT 2B Vibration Response, for RFPT 2B Vibration Alarm Response. • Confirms oil temperature is being maintained at 120°F to 130°F. • Contacts System Engineer for further instructions. With RFPT vibration > 6.0 mils, performs one of the following: (**either is acceptable**) • Trips 2B RFPT and verifies #2 Speed Limiter Runback occurs • Reduces power in an attempt to lessen the plant transient and then trips the 2B RFPT.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 5 Page 10 of 27

Event Description: RFPT '2B' receives Trouble alarm from high vibration but does NOT trip. ATC manually trips RFPT '2B'.

Time	Position	Applicant's Actions or Behavior
	SRO	With RFPT vibration > 6.0 mils, directs one of the following: **(either is acceptable)** • Directs ATC to trip 2B RFPT and verifies #2 Speed Limiter Runback occurs or • Directs operator to reduce power in an attempt to lessen plant transient and then trip the 2B RFPT.
	ATC	• If RECIRC A FLOW LIMIT, (602-134) and RECIRC B FLOW LIMIT, (602-234) are received, • Notifies SRO of Recirc A and B runback • When directed, resets A flow limit by performing the following: • Confirms initiating conditions have cleared • Confirms plant conditions are stable • Depresses "Recirc A Runback" Reset pushbutton, P602 • Receives RECIRC MASTER CONTROLLER TROUBLE, (602-129) • Verify Recirc A speed AND flow remain stable • Informs SRO the runback has been reset • When directed, resets B flow limit by performing the following: • Confirms initiating conditions have cleared • Confirms plant conditions are stable • Depresses "Recirc B Runback" Reset pushbutton, P602 • 602-129 alarm clears • Verify Recirc B speed AND flow remain stable • Informs SRO the runback has been reset • Informs SRO of >15% power change and to notify Chemistry
		*SIMULATOR OPERATOR: When the operator trips the 2B RFPT, ENSURE Event Trigger (**N21-5**) is ACTIVATED:* • *DELETES, RFPT CONTROLLER TROUBLE, (603-150), alarm in 10 seconds.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 6 Page 11 of 27

Event Description: HPCI Inadvertent Initiation.

Time	Position	Applicant's Actions or Behavior
15 Mins		*Simulator Operator* ***WAIT UNTIL THE ATC OPERATOR IS AWAY (I.E. AWAY FROM 2H11-P601 PANEL) BEFORE ENTERING THIS MALFUNCTION.*** *Simulator Operator, at Chief Examiner's direction, ENTERS (**RB-6**) malfunction mfE41_103, HPCI auto start.*
	ALL	Recognize and report HPCI has started from an invalid initiation signal.
	BOP	• Verifies reactor water level and Drywell Pressure is normal. Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC.
	BOP	• Secures HPCI as follows per Placard or 34SO-E41-001-2: (Critical Task) • Either, Places HPCI Controller in Manual and lowers output to prevent injection and then performs the following: OR: • Depresses and holds the HPCI Turbine Trip push-button. • Receives the following: • HPCI TURBINE TRIP, (601-103) • HPCI TURBINE TRIP SOLENOID ENERGIZED, (601-109) • HPCI PUMP DISCHARGE FLOW LOW, (601-231) • When HPCI turbine has stopped, places the HPCI Aux Oil Pump in Pull To Lock off. • Receives HPCI TURBINE BRG OIL PRESS LOW, (601-112) • When HPCI TURBINE BRG OIL PRESS LOW, (601-112) alarm is received, releases the HPCI Turbine Trip push-button. • HPCI TURBINE TRIP SOLENOID ENERGIZED, (601-109), clears.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 6 Page 12 of 27

Event Description: HPCI Inadvertent Initiation.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• IF injection occurs from HPCI, the following alarms occur: • FEEDWATER CONTROL SYSTEM TROUBLE, (603-132) • After HPCI is shutdown, returns Feedwater Control Mode select switch to 3-ELEM. • APRM UPSCALE, (603-219), ROD OUT BLOCK, (603-238) and REACTOR VESSEL WATER LEVEL HIGH/LOW, (603-141) may come in and then clear
		NOTE: *If Recirc Flow limits have NOT been reset, the following will already be active.*
	BOP/ATC	• When injection from HPCI is terminated, the following alarms may be in alarm:
		• If RECIRC A FLOW LIMIT, (602-134) and RECIRC B FLOW LIMIT, (602-234) are received, • Notifies SRO of Recirc A and B runback • When directed, resets A flow limit by performing the following: • Confirms initiating conditions have cleared • Confirms plant conditions are stable • Depresses "Recirc A Runback" Reset pushbutton, P602 • Verify Recirc A speed AND flow remain stable • Informs SRO the runback has been reset • When directed, resets B flow limit by performing the following: • Confirms initiating conditions have cleared • Confirms plant conditions are stable • Depresses "Recirc B Runback" Reset pushbutton, P602 • Verify Recirc B speed AND flow remain stable • Informs SRO the runback has been reset

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 6 Page 13 of 27

Event Description: HPCI Inadvertent Initiation.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator - AFTER SRO declares HPCI inop per TS 3.5.1.C, as I & C tech called to resolve the HPCI problem, inform the SRO that the HPCI initiation logic appears to be causing the inadvertent start signal and that you will be investigating the problem further.

	SRO	• Reviews TS 3.5.1, ECCS/RCIC.
		• IAW TS 3.5.1 Condition C,
		  • Declares HPCI inoperable,
		  • Must verify within one hour that RCIC is operable by administrative means
		  • Must restore HPCI to operable status within 14 days
		
		• ALSO since 2B Core Spray is inop, enters;
		  • Condition D requires either HPCI or the ECCS pump to be restored to operable status in 72 hours.
		  • Contacts Maintenance (if ATC has NOT done this) to investigate inadvertent HPCI start.
		
		• If RECIRC A FLOW LIMIT, (602-134) and RECIRC B FLOW LIMIT, (602-234) are received, directs operator to reset IAW 34SO-B31-001-2.

		Simulator operator proceeds to the next event at the Chief Examiner's direction.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 14 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, at Chief Examiners direction, *ACTIVATE (**RB-7**)* *(Earthquake – malfunctions to (ON):* *mf65702209 Window 30 SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL & mf65702227 Window 48 SEISMIC INSTRUMENTATION TRIGGERED*
	All	The following annunciators are received: • 2H11-P657 SYSTEM TROUBLE, (650-224) • SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL, (657-030) • SEISMIC INSTRUMENTATION TRIGGERED, (657-048)
	BOP	• Acknowledges 650-224, 2H11-P657 System Trouble, alarm on 2H11-P650 panel and informs the SRO of the alarm
	SRO	Dispatches the BOP to Panel 2H11-P657
		NOTE: *Actions for both ARPs are the same, except for checking the power supply.*
	BOP	Informs the SRO of the Seismic alarms and enters ARPs: SEISMIC PEAK SHOCK RECORDER HIGH G LEVEL,(657-030) and SEISMIC INSTRUMENTATION TRIGGERED, (657-048) to perform the following actions:
		• Dispatches Unit 1 RO to panel 1H11-P701 to check for further indication of a seismic event by monitoring Peak Shock Annunciator, 1L51-R620, for 12.7 Hz amber lights (> 0.08g, OBE) and 12.7 Hz red lights (> 0.15g, DBE)

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 15 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		SIMULATOR OPERATOR: After one minute, ***Notifies Unit 2 Control Room that you were in the Reactor Building and felt the floor vibrating.***
	BOP	• May have the Unit 1 RO check the following: • Peak Shock Annunciator, 1L51-VDC-R620, plugged in on panel 1H11-P701 • BRKR 3 on 120/208V Essential AC Cab., 1R25-S065 • May have I & C refer to Seismic Instrumentation Earthquake Response Manual, SX-18271, for guidance in analyzing seismic data. • Enters 34AB-Y22-002-0, Naturally occurring Phenomenon • May inform the Shift Manager to evaluate an Emergency Classification
	SRO	Directs the BOP to enter 34AB-Y22-002-0, Naturally occurring Phenomenon, if NOT already entered. • Reviews TLCO3.3.6 Seismic Monitors Condition C: • TLCO3.3.6 Condition C requires: • C.1 – Submit a Special Report to the SEB describing the magnitude, frequency spectrum, and resultant effect on facility features important to safety. C.2 – Perform TSR 3.3.6.3

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 16 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		SIMULATOR OPERATOR: ***Immediately after being dispatched to check the Shock recorder on 1H11-P701 panel, inform the team that the following lights are illuminated:*** • *12.7 Hz* ***amber*** *lights (> 0.08g, OBE)* *AND* • *12.7 Hz* ***red*** *lights (> 0.15g, DBE)* *(Immediately is appropriate since this indicator is on Unit 1, but right next to the Unit 2 SRO desk. It is NOT simulated in the Simulator since it is a Unit 1 only instrument.)*

	SRO	• Determines that all electrical power is available
		• Directs the crew to enter 34GO-OPS-013-2, Normal Plant shutdown
		• Contacts switchyard maintenance to assist in switchyard damage assessment
		• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage
		• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if NOT performed by the BOP):
		  • 1P11-F167, CST Sump to Radwaste Drain
		  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard
		  • 2P11-F051, Retaining Wall Drain
		  • 2P11-F100, Transfer Pump Wall Drain
		  • Dispatches personnel to inspect the plant for damage
		• Dispatches personnel to inspect specific Control Room panels
		• May go ahead and scram the reactor since the reactor is at low power.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		NOTE: These actions are redundant to the SROs and either can perform.

	BOP	• Enters 34AB-Y22-002-0 and performs the following actions:
		• Determines that all electrical power is available
		• Informs SRO of the requirement to enter 34GO-OPS-013-2, Normal Plant shutdown.
		• Contacts switchyard maintenance to assist in switchyard damage assessment
		• Contacts Maintenance to inspect Independent Spent Fuel Storage Installation (ISFSI) for damage
		• Within one hour , dispatches personnel to locally close or confirmed closed the following valves (if NOT performed by the SRO):
		  • 1P11-F167, CST Sump to Radwaste Drain
		  • 1P11-F3002, Condensate Transfer Pumps and Sample Sink Drain Line to Yard
		  • 2P11-F051, Retaining Wall Drain
		  • 2P11-F100, Transfer Pump Wall Drain
		• Dispatches personnel to inspect the plant for damage
		• Dispatches personnel to inspect specific Control Room panels

	ATC	• Enters 34GO-OPS-013-2 and starts making preparations for shutting down. • As power is reduced, monitors reactor power. • When directed, begins inserting control rods.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 18 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		SIMULATOR OPERATOR, after 5 minutes and at Chief Examiners direction, *ACTIVATE (**RB-8**)* *Torus leak at (3/4") 0.75"/min)* *svoT48140 (70/.75), svoT48142 (50/10), svoT48143 (50/10), svoT48147 (50/10), svoT48148 (50/100)* ***NOTE:*** *This leak will be modified to 2"/minute at 142 inches in the Torus.*
	ALL	The following annunciators are received: • PANEL 2H11-P657 SYSTEM TROUBLE, (650-224) • TORUS S-W AREA INSTR SUMP LVL HIGH, (657-086) • TORUS N-W AREA INSTR SUMP LVL HIGH, (657-087) • TORUS N-E AREA INSTR SUMP LVL HIGH, (657-088) • TORUS S-E AREA INSTR SUMP LVL HIGH, (657-089) • TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH, (657-104) • TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH, (657-105) • TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH, (657-106) • TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH, (657-107) • TORUS N-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-013) • TORUS S-E AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-031) • TORUS N-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-049) • TORUS S-W AREA INSTR SUMP LVL HIGH-HIGH-HIGH, (657-067)
	BOP	• Reports multiple alarms to SRO indicating a break in the Reactor Building. • Directs SO/Maintenance to investigate the leak.
	SRO	• Directs BOP to 2H11-P657 panel. • When above alarms are reported, directs operator to monitor Torus water level and then if lowering, enter 34AB-T23-004-2, Torus Water Level.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 19 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: ***Four minutes after being dispatched to check for leaks in the Torus section of the Reactor Building, report to the crew:*** *A leak has been identified on the "2B" Core Spray line between the Torus and the first Core Spray isolation valve.*
	All	• TORUS WATER LEVEL HIGH/LOW, (602-235) annunciates • Recognizes that torus level is decreasing.
	SRO	• Dispatches personnel to determine the location of the Torus leak. • If NOT already directed, directs NPO to enter 34AB-T23-004-2, Torus Water Level, and to monitor Torus water level. • Enters the PC EOP Flowchart when Torus level decreases to 146 inches. • May determine that water will NOT be added to the torus until the cause of the low torus level is identified and controlled. • Enter SC EOP flowchart for SC area water levels being high.
	BOP	• If NOT already performed, dispatches personnel to the Torus area AND the Reactor Building diagonals to determine the source of the water loss (if the leak location has NOT already been reported).
		NOTE: *The reactor mode switch to 'Shutdown' will activate EVENT TRIGGER* ***C71-8*** *causing a RWCU leak (0.25 rate) in the Drywell.*
	SRO	• IAW the PC flowchart, prior to water level reaching 98 inches, determines that the reactor is required to be shutdown and enters the RC flowchart at point A. • Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches. • Directs RWL Band of 3 to 50 inches.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to shutdown.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • If NOT tripped, places the Recirc pumps at minimum speed.
		  • Inserts SRMs and IRMs.
		  • Shifts recorders to read IRMS, when required.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

	BOP	Performs RC-2 actions consisting of:
		• Confirms proper Level Control response:
		  • Checks ECCS Injection Systems
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value (will NOT due to low power)
		  • Set down does NOT auto function (low power), manually reduces FW Master Controller setpoint to approximately 9 inches.
		• When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125 (normally open).
		  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Closes 2N21-F110.
		  • Will control RWL and with SRO permission will raise RWL to 32 to 42 inches.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 7 Page 21 of 27

Event Description: Earthquake requiring SCRAM prior to 98" in Torus. Leak in Drywell requiring Torus Sprays.

Time	Position	Applicant's Actions or Behavior
	BOP	Performs RC-3 consisting of: • Monitor RPV pressure. • Confirm proper operation of pressure control system (TBV, LLS, etc.). • If necessary, allow RPV pressure to exceed 1074 psig then cycle any SRV to initiate LLS. • Maintain RPV pressure between 1074 and 800 psig. • Notify SRO of pressure control system operation.
	ATC/BOP	• Re-opens 2P41-F316s per 34AB-P41-001-2, Loss of PSW, Placard • Places the "A" and "B" Isolation Override switches on the 2H11-P652 panel to Override • Fully opens 2P41-F316A or C and 2P41-F316B or D • Throttles 2P41-F316C or A and 2P41-F316D or B to open while monitoring PSW division 1 and 2 pressure on 2H11-P650 panel ensuring that PSW pressure remains above 80 psig
	SRO	• If the need to Emergency Depressurize is recognized in time, then Anticipates Emergency Depressurization. • Assign an operator to fully open all Main Turbine Bypass Valves.
	ATC/BOP	• On the DEHC panel • Selects the Control > Bypass Valve screen. • Inserts a ramp rate of 100, and then presses OK. • Inserts a bypass valve position of 100, and then presses OK. • Checks that the Bypass Valve Jack status is active. • Recognizes that ONLY 1 Bypass Valves will open. • Reports to the SRO that 2 Bypass Valves are failed closed and only 1 Bypass valve is open.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 8 Page 22 of 27

Event Description: RHR 2E11-F027A or B RHR Torus Spray or Test Valve failed closed.

Time	Position	Applicant's Actions or Behavior
	SRO	• Per the PC flowchart, verifies Torus level is <285 inches and directs an operator to place Torus Sprays in service
		*Simulator Operator, confirm EVENT TRIGGER (**E11-1 or E11-2**) is activated when the operator positions 2E11-F027A or B to open.*
	ATC	• Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows: • Places Cnmt Spray Vlv Cntl switch in the MANUAL position. • Starts RHR pump(s) in loop A or B, if NOT already running. • Opens 2E11-F028A or B • Opens 2E11-F027A or B (ONE WILL NOT OPEN AND OPERATOR TRANSITIONS TO THE OTHER LOOP) • Throttles Open 2E11-F027A or B (*Critical Task*) • Notifies SRO that RHR is in Torus Sprays (The flow is only 700 gpm, so it may be difficult to see flow indication from a distance.)
	ATC	• Informs SRO that the 2E11-F027A or B will NOT Open
	SRO	• Directs ATC to spray the Torus with the other loop of RHR.
	SRO	• As time allows, directs an operator to perform 31EO-EOP-114-2 for RHR & CS • If time allows, directs an operator to restore Drywell chillers and coolers per 31EO-EOP-100-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 8 Page 23 of 27

Event Description: RHR 2E11-F027A or B RHR Torus Spray or Test Valve failed closed.

Time	Position	Applicant's Actions or Behavior
		NOTE to Evaluators: If crew addresses restoring DW Chillers they will NOT be able to due to Drywell temperature above 250°F.
		NOTE: Torus pressure is NOT expected to exceed 11 psig. due to the RWCU leak in the Drywell.
	SRO	• Directs H_2/O_2 Analyzers placed in service IAW 34SO-P33-001-2.
	BOP	Notifies the SSS to perform actions for RHR per 31EO-EOP-114-2.
	BOP	IAW 31EO-EOP-114-2, the operator performs the following: • CLOSES RHR OUTBD INJ VLV, 2E11-F017A • CLOSES RHR OUTBD INJ VLV, 2E11-F017B • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017A • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017B • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017A • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017B • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005A • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005B • Trips Core Spray pump A, 2E21-C001A • Trips Core Spray pump A, 2E21-C001B • Notifies SRO 31EO-EOP-114-2 actions for RHR & CS are complete
	ATC	• Places H_2/O_2 Analyzers in service IAW 34SO-P33-001-2 • Depresses Channel A and Channel B Reset pushbuttons on 2H11-P700 panel. • Confirms Analyzers are running. • Notifies SRO H_2/O_2 Analyzers are in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-01 **Event No.:** 9

Event Description: Unisolable Torus leak worsens and Emergency Depress prior to 98" in Torus.

Time	Position	Applicant's Actions or Behavior
	ATC	• Provides periodic updates on Torus level to the SRO.
	SRO	Transitions to CP-1 and orders 7 ADS valves open for Emergency Depress.
	ATC/BOP	• Places the switches for 7 ADS valves in the open position. *Critical Task – Open 7 SRVs BEFORE Torus water level reaches 98 inches. Critical task is met when at least 5 SRVs have been opened.* • The amber lights for the SRVs will NOT illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614). • Depending on Reactor Water Level prior to opening ADS valves, RWL may swell to above 60 inches, requiring the operator to enter 34AB-C32-001-2, Reactor Water Level Above 60 inches. Operator secures all injection other than CRD.
		NOTE: *The Critical task is met when 5 SRVs have been opened (EOP minimum number of SRVs required to Emergency Depressurize the RPV).*
		With Chief Examiners Permission the Scenario will be terminated when Reactor pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.: 8-01** **Op-Test No.: 2013-301**

Initiating Conditions:	Unit 2 is operating at 60% RTP. RFPT '2A' operating at 2100 rpm.
Turnover	Continue startup and place 2A RFPT in service starting at step 7.1.11.2.10 of 34SO-N21-007-2. (All steps are complete thru 7.1.11.2.9 of 34SO-N21-007-2) After RFPT '2A' is in service, increase reactor power to 75% RTP IAW 34GO-OPS-005-2.

Summary:

- **Event 1**: Normal; The "2A" RFPT will be placed into service IAW 34SO-N21-007-2.
- **Event 2**: Reactivity; Increase reactor power via Recirc to 75% RTP.
- **Event 3**: Component; RBCCW Pump '2A' will experience a sheared shaft and the standby RBCCW pump will NOT automatically start. The operator will manually start the standby RBCCW pump to restore system flow/pressure to normal.
- **Event 4:** Component/TS; 2B Loop of Core Spray experiences high discharge pressure (valve leakage). When operator performs ARP actions and 2E21-F004B control switch is placed to open, the valve breaker trips causing the 2B CS Loop to be inop.
- **Event 5:** Component; The '2B' RFPT receives a high vibration trip signal but does NOT automatically trip. The ATC manually trips the '2B' RFPT.
- **Event 6**: Component; /TS; The HPCI system will experience an inadvertent start. The operator takes manual control to secure HPCI. **(Critical Task)**
- **Event 7:** Major; The plant experiences an Earthquake causing Torus water level to start lowering, SCRAM prior to 98 inches. **(Critical Task)** A leak in the Drywell requiring Torus Sprays and #1 & #3 Bypass valves fail closed (can NOT be opened).
- **Event 8:** Component; RHR 2E11-F027A or B Torus Spray/Test Valve (depends on which loop of RHR the operator attempts first) will fail closed when the operator attempts to place Torus Spray/Cooling in service. The operator must transition to the other loop of RHR to spray the Torus.
- **Event 9:** Component; Unisolable Torus leak worsens and Emergency Depress prior to 98" in Torus. **(Critical Task)**

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.: 8-01** **Op-Test No.: 2013-301**

Critical Tasks

- The HPCI system will experience an inadvertent start. The operator takes manual control to secure HPCI. **(Event 6)**
- The plant experiences an Earthquake causing Torus water level to start lowering, SCRAM prior to 98 inches. **(Event 7)**
- Unisolable Torus leak worsens and Emergency Depress prior to 98 inches in Torus. **(Event 9)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	7	1. RBCCW Pump '2A' sheared shaft **(Event 2)** 2. 2B Loop of CS valve leakage **(Event 3)** 3. 2B RFPT trip failure. **(Event 4)** 4. HPCI inadvertent start **(Event 6)** 5. Earthquake causing Torus water level to start lowering, SCRAM prior to 98". **(Event 7)** 6. RHR 2E11-F027A or B failure **(Event 8)** 7. Emergency Depress > 98" in Torus. **(Event 9)**
2.	Malfunctions After EOP Entry	1-2	1	1. RHR 2E11-F027A or B failure **(Event 8)**
3.	Abnormal Events	2-4	3	1. RBCCW Pump '2A' sheared shaft (**Event 2**) 2. HPCI inadvertent start **(Event 6)** 3. Earthquake causing Torus water level to start lowering, SCRAM prior to 98". (**Event 7**)
4.	Major Transients	1-2	2	1. Earthquake causing Torus water level to start lowering, SCRAM prior to 98". (**Event 7**) 2. Torus leak worsens, ED prior to 98". (**Event 9**)
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) **(Event 7)** 2. PC Primary Containment Control **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP-1 **(Event 9)**
7.	Critical Tasks	2-3	3	1. HPCI inadvertent start manual control to secure **(Event 6)** 2. Earthquake causing Torus water level to start lowering, SCRAM prior to 98". **(Event 7)** 3. Emergency Depress > 98" in Torus. **(Event 9)**

NRC DRAFT

ILT-8 NRC Operating Exam Scenario 1

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 60% power with RFPT '2A' operating at 2100 rpm. Main Condenser Water Boxes have been vented. Activities in progress: Place 2A RFPT in service.

Protected Train:	**EOOS:**	
☒ Division I	☒ Green	☐ Orange
☐ Division II	☐ Yellow	☐ Red

Scheduled evolutions:	☐ Place 2A RFPT in service starting at step 7.1.11.2.10 of 34SO-N21-007-2. (All steps are complete thru 7.1.11.2.9 of 34SO-N21-007-2) After RFPT '2A' is in service, increase reactor power to 75% RTP IAW 34GO-OPS-005-2.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ None
Active tagouts:	☐ None
Rod Configuration:	☐ See RWM

Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I Hatch **Scenario No.:** 8-02 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is at 90% power. 4160V 2F is on Alternate Supply from SAT 2C.

Turnover: Transfer 4160V 2F from alternate, SAT 2C, to normal, SAT 2D, IAW 34SO-R22-001-2. Once complete, increase reactor power to 95%.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Transfer 4160V 2F from alternate, SAT 2C, to normal, SAT 2D, IAW 34SO-R22-001-2.
2		R (ATC)	Raise Reactor power to 95% using Recirc.
3	rfC11_141	TS (SRO)	The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.
4	mf70022407	C (BOP)	'2C' SSAC high temp condition. '2A & 2B' SSACs are manually started by BOP
5	mfE51_114 diE51A-S17	C (ATC) TS (SRO)	RCIC Inadvertent start with Trip pushbutton failure.
6	mfT41_147	C (BOP)	Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Rx. Bldg. Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp. (Critical Task)
7	mf65031532	C (ATC)	RFPT 2B Bearing oil pressure low requiring manual tripping of RFPT which results in entering the Immediate Exit Region of the P/F Map.
8	mfE51_250 svoE51074 svoE51075 diT41-B009	M (ALL)	Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.
9		M (ALL) C (ATC)	Emergency Depress when Max Safe exceeded in more than one area. (Critical Task).
10	mfB21_129A mfB21_129E mfB21_129L mfB21_129M	C (ATC)	ADS valves (4) fail to open when Emergency Depress is required (Critical Task)
*	(N)ormal,	(R)eactivity,	(I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 1 Page 2 of 28

Event Description: Transfer 4160V 2F from alternate supply, SAT 2C, to normal supply, SAT 2D, IAW 34SO-R22-001-2.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to transfer 4160V Emergency Bus 2F from Alternate (SAT 2C) to the Normal (SAT 2D) as IAW 34SO-R22-001-2, 4160 VAC System.
	BOP	IAW Section 7.3.4.2, Transfers 4160 VAC 2F from Alternate (SAT 2C) to the Normal (SAT 2D) as follows: • Confirms power is available from SAT 2D as indicated by the potential lights on panel 2H11-P651 • Places Sync Switch (SSW) ACB 135574 in ON • Places ACB 135574, 4160V Bus 2F Normal Supply breaker, control switch, to CLOSE
		NOTE: *4160V BUS 2F BRKR 135564, TRIPPED/LKDOUT, (652-217) will alarm when performing the following step.*
	BOP	• Confirms ACB 135564, 4160V Bus 2F Alternate Supply breaker, TRIPS • Places ACB 135564 control switch to TRIP AND confirms amber light is NOT lit • Confirms 4160V BUS 2F BRKR 135564, TRIPPED/LKDOUT, (652-217) clears. • Places Sync Switch (SSW) ACB 135574 in OFF
	BOP	• Notifies the SRO that 4160 VAC 2F bus has been transferred from the Alternate to Normal supply AND should consider returning 4160V Buses 2C AND 2D to their Normal supply, if on Alternate.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 2 Page 3 of 28

Event Description: Raise Reactor power to 95% using Recirc.

Time	Position	Applicant's Actions or Behavior
5 Mins	SRO	Directs the ATC to increase Rx Power to 95% using Recirc.
	ATC	IAW 34SO-B31-001-2, the ATC increases Recirc pump speed, not to exceed 10 MWE per minute by depressing the RAISE SLOW or RAISE MEDIUM pushbuttons on the Master or Individual controls until reactor power is 95%.
	ATC	Complies with 34SO-B31-001-2 Limitation 5.2.15 which states: WHEN changing Recirc pumps speed while in Two Loop operation maintain pump speeds to limit recirculation loop jet pump mismatch within the following limits: < 10% of rated core flow (7.7 E6 lbm/hr) WHEN operating < 70% of rated core flow; AND < 5% of rated core flow (3.85 E6 lbm/hr) WHEN operating at > 70% of rated core flow.
	ATC	Notifies the SRO that reactor power has been increased to 95%.
		NOTE: *May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238) alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.* *May also get Alarm HEATER TROUBLE, 650-135 alarm. This is expected at this power level.*
		Simulator Operator, at the Chief Examiners direction OR after power has been increased by 5%, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 3

Event Description: The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

Time	Position	Applicant's Actions or Behavior
10 Min		*Simulator Operator, at the Chief Examiner's direction, ENTERS (**RB-3**) rfC11_141, SDV Outboard Valves close* *AND* *3 minutes later ENSURES Event Trigger **C11-4** ACTIVATES mf60311307, SDV Not Drained, alarm.*
	ALL	• When the SDV NOT DRAINED, (603-119), alarm is received, recognizes that the SDV Outboard Valves have closed. (May recognize prior to alarm by scanning the control boards)

	ATC	• Enters 603-119 and performs the following:
		  • Determines that 2C11-F035A, 2C11-F035B and 2C11-F037 have closed.
		  • Determines status of all Scram Valves (blue lights are not lit) on P603 display.
		  • Determines status of SCRAM VLV PILOT AIR HDR PRESS HIGH/LOW, (603-131), (NOT LIT)
		  • Determines if any Rod Drift lights on P603 (None).
		  • Confirms Scram Disch Vol Isol Test Switch in Normal.
		  • Dispatches SO to the CRD drives to check for leaking Scram Outlet Valves.
		  • Dispatches SO/Maintenance to determine if an air leak exists on the SDV valve piping.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 3 Page 5 of 28

Event Description: The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, if a SO was sent to the solenoid power switches, 2 minutes later, REPORTS that the Power supply switches in the RPS M/G Set room for 2C11-F040 solenoids are turned to "ON". *Simulator Operator, wait 3 minutes, then REPORT as a SO that's been dispatched to check for air leaks, there is an air leak on the piping from 2C11-F040 on the 130' Rx. Bldg. It appears that the copper piping was bumped by someone or something, causing a crimp and small leak in the piping.*
	ATC	• Notifies the SRO that there is an air leak and crimped piping at 2C11-F040.
	SRO	• Enters Tech spec 3.1.8 Condition A which requires the SDV line to be isolated within 7 days. • May inform Maintenance to correct the associated air leak.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 4 Page 6 of 28

Event Description: '2C' SSAC high temp condition and secured. '2A & 2B' SSACs are manually started.

Time	Position	Applicant's Actions or Behavior
5 Min.		*SIMULATOR OPERATOR:* *At the direction of the Chief Examiner ACTIVATE (**RB-4**)* • *mf70022407 Control Bldg Aftclr B001C Disch Temp High (Alarm On)* • *aoP52-R600 "Service Air Pressure"* • *aoP51-R600 "Control Air Pressure"* ***NOTE:** SSAC 2B will fail to auto start on lowering pressure. Event Trigger (**P51-2**) will remove this override when SSAC 2B is manually started.*
		SIMULATOR OPERATOR: *When the operator dispatches a SO locally , wait 2 minutes, then NOTIFY operator that local temp on 2P51-R312C is 125°F and 2P51-R302C is reading 385°F.* *If requested by operator, report standby SSAC oil levels are normal and Aftercooler/Intercooler drains have been cycled.*
	BOP	Responds to annunciator CONTROL BLDG AFTCLR B001C DISCH TEMP HIGH, (700-216): • Sends SO to locally confirm temperature is > 120 deg F on 2P51-R312C and 2P51-R302C. • Starts the 2A and/or 2B Service Air Compressor • Secures the 2C Service Air Compressor by placing its control switch in Pull-to-Lock when the local report is given or earlier as directed by the SRO. • Dispatches SO/Maintenance to investigate high temperature alarm.
		*SIMULATOR OPERATOR: When the operator secures the 2C Service Air Compressor, ENSURE Event Trigger (**P51-1**) is ACTIVATED: DELETES the following:* • *aoP52-R600 'Service Air Pressure'* • *aoP51-R600 'Control Air Pressure'* • *mf70022407 'Control Bldg Aftclr B001C Disch Temp High' (Annunciator On) 30 seconds later.*
	BOP	Annunciator CONTROL BLDG AFTCLR B001C DISCH TEMP HIGH, (700-216) clears.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 5 Page 7 of 28

Event Description: RCIC Inadvertent start with Trip pushbutton failure.

Time	Position	Applicant's Actions or Behavior
6 Mins		*Simulator Operator: At the direction of the Chief examiner, ACTIVATE: (**RB-5**) to ENTERS mfE51_114 and diE51A-S17 to "off".*
	All	• Receives SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) alarm • Recognizes that RCIC has started.
	ATC	• Determines RCIC has auto started and that RWL is normal.
	SRO	• Tells operator that RWL is normal • Directs operator to trip RCIC

	ATC	• Attempts to Trip RCIC by depressing the RCIC Trip pushbutton and recognizes that the Trip pushbutton is failed.
		• Notifies the SRO that the RCIC trip pushbutton has failed and Trips RCIC by ONE of the following methods:
		  • Closes the Trip and Throttle valve, 2E51-F524 OR
		  • Places controller 2E51-R612 to Manual and reduces output to lower RCIC discharge pressure to below reactor pressure.
		• Receives RCIC TURBINE BRG OIL PRESS LOW, (602-304) & RCIC PUMP DISCHARGE FLOW LOW, (602-322)

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 5

Event Description: RCIC Inadvertent start with Trip pushbutton failure.

Time	Position	Applicant's Actions or Behavior
	ATC	• Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC • Enters 34SO-E51-001-2, RCIC System • Dispatches RO/Maintenance to determine cause of initiation signal and the cause of the Trip pushbutton failure. • May attempt to reset the Initiation signal • Will close 2E51-F524, Trip and Throttle Vlv, if not already closed. • Notifies SRO that RCIC is shutdown.
	SRO	• May have the operator run the Trip and Throttle Valve down to in case RCIC is needed later. • Enters TS RAS for RCIC 3.5.3 Condition A, which requires verifying HPCI is operable within 1 hour and restoring RCIC in 14 days.
		NOTE: *It is intended that RCIC is left in its' current condition and not returned to standby. The operator can restart RCIC from its current condition during the major event, if desired.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
15 Min		*At Chief Examiners direction the Simulator Operator ENTERS (**RB-6**) mfT41_147, Rx Bldg Exhaust Fan A fails & standby does NOT start*
		On the 2H11-P650 panel alarms, PANEL 2H11-P654 PANEL SYSTEM TROUBLE, (650-214) and PANEL 2H11-P657 PANEL SYSTEM TROUBLE, (650-224) are received.
	BOP	• Announces the alarm to the SRO
	SRO	• The SRO repeats the alarm and dispatches the BOP operator to the 2H11-P654 & P657 panels.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6 Page 10 of 28

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
		NOTE: *This failure will require entry into the SC EOP Flow Chart as well as two Abnormal procedures. The following sequence may be slightly out of order because of this.*
		NOTE: *If the operator enters 657-081 first, then the following actions will be addressed, otherwise skip to the next alarm.*
	BOP	• Enters RB EXHAUST FAN 2T41-C007A/B FLOW LOW, (657-081) alarm and performs the following actions:

		• Confirms the Standby Rx Bldg Vent Exhaust Fan has not automatically started (IT SHOULD HAVE AUTO STARTED), the operator will place the control switch for 2T41-C007A to OFF AND 2T41-C007B to Run.
		• Confirms the following dampers are OPEN:
		  • 2T41-F044A, R/B Inboard Isol Dampers Inacc. Areas Exhaust Fans Disch on 2H11-P657.
		  • 2T41-F044B, R/B Outboard Isol Dampers Inacc Areas Exhaust Fans Dish on 2H11-P654.
		  • 2T41-F028, Rx Bldg Vent Filter D005 Inlet Damper on 2H11-P657.
		  • Confirms RB Exhaust flow on 2T41-R618 point 2 is indicating approximately 6.5 KCFM.

		• Once RB Exhaust and Supply flows have stabilized, confirms RB INSIDE TO OUTSIDE AIR DIFF PRESS LOW, (654-001) clears and notifies SRO.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6 Page 11 of 28

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
		If the operator enters (654-001) first, then the following actions will be addressed.
	BOP	• Enters RB INSIDE TO OUTSIDE AIR DIFF PRESS LOW, (654-001) alarm and performs the following actions: • Confirms Reactor Building to outside air differential pressure, is less than -0.06" WC, as indicated on 2T46-R604B, Sec Cnmt Diff Press B, red pen, 2H11-P700. • Determines that the 2T41-C007A, 'Rx Bldg Exhaust' fan red light is lit and the 2T41-C001A, 'Rx Bldg Supply' fan red light is lit.
		• Determines RB Exhaust flow on 2T41-R618 point 2 is indicating approximately 0 KCFM. • Informs the SRO that the 2T41-C007A, 'Rx Bldg Exhaust' fan is running (Red light lit) and the 2T41-C001A, 'Rx Bldg Supply' fan is running (Red light lit) and that Rx Bldg dp is 0". • Dispatches a SO/Maint to confirm 2R25-S065, BRKR 15 is closed and to investigate why the RB Exhaust fan has a low flow condition. • Enters 34AB-T22-002-2, 'Loss of Secondary Containment Integrity' and 34AB-T22-003-2, 'Secondary Containment Control', and notifies Management of the plant conditions.
	BOP	• Enters 34AB-T22-003-2, 'Secondary Containment Control'. • Monitors secondary containment parameters. • Notifies the SRO to enter 31EO-EOP-014-2, EOP Secondary Containment flowchart due to low RB dp. • Dispatches a SO/Maint to investigate the low RB dp. • Enters 34AB-T22-002-2, 'Loss of Secondary Containment Integrity'.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
	SRO	• Dispatches a SO/Maint to determine why the Rx Bldg Fan experienced low flow and why the standby fan did not start. • Enters 31EO-EOP-014-2, EOP Secondary Containment flowchart.
		Simulator Operator waits 2 minutes and reports to the SRO, as a SO, that Breaker 15 at 2R25-S065 is closed. Also report as Maintenance that the A RB Exhaust fan shaft is broken.
	SRO	Directs operator to start RB Ventilation using the 2T41-C007B, 'RB Exhaust' fan or SBGT with suction from the Rx Bldg.
		If the SRO directs SBGT started, the following actions will be taken, otherwise skip this part.
	BOP	• Starts the 2A or 2B SBGT with a suction from the Rx Bldg by performing the following:
		• At 2H11-P657 for "2A" or 2H11-P654 for "2B" performs the following action IAW the SBGT Placard or 34SO-T46-001-2, SBGT System. • Opens 2T46-F001A(B) • Places SBGT A (B) in RUN position. • Confirms 2T46-F002A (B) OPENS. • Confirms SBGT A (B) HTR Red Light ILLUMINATES. • Confirms SBGT Flow increases to 1500 - 4000 SCFM.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
		If normal ventilation is shutdown, the SRO will direct Rx Bldg Ventilation to be restarted and the following actions taken, otherwise skip this part. ***NOTE:*** *It is NOT intended to wait until Rx Bldg Ventilation is restarted or SBGT is returned to Standby, therefore, at Chief Examiner's direction, move on to the next Event*
	SRO	• Orders the Rx Bldg Ventilation system re-started IAW 34SO-T41-005-2.
		If the SRO directs RB Ventilation started the following actions will be taken, otherwise skip this part.
	BOP	• Enters 34SO-T41-005-2 and performs the following actions: • Momentarily depresses Rx Bldg Supply Fans Reset. • Momentarily depresses Rx Bldg Recirc Fan 2T41-B017 Reset.
		Simulator Operator, when requested to perform the following, inform the operator that the Unit 1 pushbuttons have been depressed.
	BOP	• Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR RESET A pushbutton, panel 1H11-P657. • Requests U1 to depress 1T41/2T41, Rx Bldg/Rf Flr ISOL DMPR Reset B pushbutton, panel 1H11-P654. • Momentarily depresses 2T41-D005, Reactor Building Filter, Deluge reset. • Opens 2T41-F028, Rx Bldg Vent Filter D005 Inlet Damper. • Confirms Open/Opens 2T41-F044A, Rx Bldg Inboard Isol Dampers Inaccessible Areas Exhaust Fans Disch.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
	BOP	• Confirms Open/Opens 2T41-F044B, Rx Bldg Outboard Isol Dampers Inaccessible Areas Exhaust Fans Disch, panel 2H11-P654. • Places in RUN 2T41-C007B, Rx Bldg Vent Exhaust Fan. • Places in STBY 2T41-C007A, Rx Bldg Vent Exhaust Fan. (Fan Broke may be left in off) • Confirms Open/Opens 2T41-F011A, Rx Bldg Inboard Isol Dampers Supply Fans Disch.
	BOP	• Confirms Open/Opens 2T41-F011B, Rx Bldg Outboard Isol Dampers Supply Fans Disch, panel 2H11-P654. • Places in RUN 2T41-C001A or 2T41-C001B, Rx Bldg Supply Fan. • Places in STBY 2T41-C001B or 2T41-C001A, Rx Bldg Supply Fan.
	BOP	• Dispatches a SO to perform the following:
		• ADJUST 2T41-FC-R027 to maintain Rx Bldg Vent Exhaust Flow approximately 6.5 KCFM as indicated by the green pen on 2T41-R618, flow recorder, located on 2H11-P657. • ADJUST 2T41-FC-R022 to maintain Rx Bldg Vent Supply Flow approximately 5.3 KCFM as indicated by the red pen on 2T41-R618, flow recorder, located on 2H11-P657. • While maintaining approximately 6.5 KCFM for Rx Bldg Vent Exhaust Flow and 5.3 KCFM Bldg Vent Flow respectively, • ADJUSTS Flow Controllers 2T41-FC-R027 and 2T41-FC-R022 to obtain 0.25 inches water pressure on 2T46-DPR-R604A&B.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 6

Event Description: Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. Standby Exhaust fan manually started or SBGT fan started to re-establish Rx Bldg dp.

Time	Position	Applicant's Actions or Behavior
	BOP	• Informs the SRO that the Rx Bldg dp has returned to normal
	SRO	• If SBGT was started, directs SBGT returned to Standby and exits the SC EOP Flowchart
		NOTE: *It is NOT intended to wait until SBGT is returned to Standby, therefore, at Chief Examiner's direction, move on to the next Event*

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 7 Page 16 of 28

Event Description: RFPT 2B Bearing oil pressure low requiring manual tripping of RFPT which results in entering the Immediate Exit Region of the P/F Map.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator *Contact the ATC by phone and instruct to remain on the line until told to hang up, THEN at direction of the Chief Examiner, ACTIVATE: (**RB-7**) mf65031532 Window 10: RFP/RFPT A Brg Oil Press Low (ON).*

	ATC	• Enters ARP RFPT/RFP A BRG OIL PRESS LOW, (650-310)
		• Confirms at least one of the following pumps are running:
		  • Either Main AC Oil Pump 2N34-C007A (ON) or 2N34-C007B (OFF)
		  • Brg Emerg Oil Pump, 2N34-C009 (OFF)
		• Starts second RFPT 2A Main AC Oil Pump 2N34-C007B
		• Notifies SRO the alarm did NOT clear with second AC Oil pump running and to reduce power IAW 34GO-OPS-005-2.
		• Dispatches SO locally to determine RFPT 2A oil pressures.

		*Simulator Operator, As the SO, wait 2 minutes after being dispatched OR prior to the crew starting a power reduction, **ONLY** report that 2A RFPT RFP bearing oil pressure is 1.5 psig and decreasing slowly.*
	SRO	• Directs ATC to trip 2A RFPT OR • Directs the ATC to reduce power in an attempt to lessen the plant transient and then directs ATC to trip the 2A RFPT. • Directs BOP to verify #2 Speed Limiter Runback occurs

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 7

Event Description: RFPT 2B Bearing oil pressure low requiring manual tripping of RFPT which results in entering the Immediate Exit Region of the P/F Map.

Time	Position	Applicant's Actions or Behavior
	ATC	• With RFPT oil pressure < 4 psig, • Trips 2A RFPT • RFPT 2A TRIP, (650-325) alarms • RFP C005A DISCH FLOW LOW, (656-039) alarms • Verifies #2 Speed Limiter Runback occurs OR • ATC reduces power in an attempt to lessen the plant transient and then the BOP trips the 2A RFPT. • Directs SO to close the following: • 2N38-F003A, Low Pressure Steam to RFPT 2A (2H21-P216) • 2N11-F002A, High Press Steam to RFPT 2A (2H21-P244) • 2N21-F161A and 2N21-F161D, Gland Seal Injection Inlet and Leakoff Intermediate Outlet Isolation Valves. • Closes 2N21-F107A, RFP 2A Suction (2H11-P650) • May secure 2A RFPT Turning Gear Motor to prevent rotation of 2A RFPT IAW 34SO-N21-007-2.
	BOP	Notifies chemistry of 15% power change in 1 hour IAW 34GO-OPS-005-2, "Power Changes", Step 5.2.13.
		EXAMINER NOTE: *Log time when Region of Instabilities/Immediate Exit Region has been entered.* **Time:** _____
		NOTE: *IT IS NOT INTENDED TO INSERT CONTROL RODS TO EXIT THE REGION, THEREFORE WITH CHIEF EXAMINERS APPROVAL PROCEED TO MAJOR EVENT.* *HEATER TROUBLE ALARM, (650-135) may alarm due to plant conditions.* ***NOTE:*** *15% power change sample required IAW limitation 5.2.13, 34GO-OPS-005-2.*

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 8 Page 18 of 28

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
15 Min		*At the Chief Examiner's direction, Simulator operator, ENTER (**RB-8**) mfE51_250, RCIC Steam Line, break 70/3.5, svoE51074 (2E51-F007 Stuck Open), svoE51075 (2E51-F008 Stuck Open), diT41-B009 & diT41-B026 to off.* ***NOTE:*** *It takes approximately 3 minutes for the first alarm, LEAK DET DIFF TEMP HIGH, (601-321), to alarm.*

	All	• Receives the following:
		  • LEAK DET DIFF TEMP HIGH, (601-321) in 3 minutes
		  • RCIC ISOL TIMER INITIATED, (602-303) in 3.5 minutes
		  • LEAK DET AMBIENT TEMP HIGH, (601-327) in 4 minutes
		  • RCIC ISOLATION SIGNAL LOGIC A INITIATED, (602-307) after timer times out
		  • RCIC ISOLATION SIGNAL LOGIC B INITIATED, (602-313) after timer times out

	SRO	• Orders BOP to evaluate leak detection alarms on 2H11-P601. • Orders RCIC to be isolated. • Orders BOP to evacuate the Reactor Building. • May notify Maintenance for assistance in closing RCIC valves if ATC/BOP does not.
	ATC/BOP	• Responds to RCIC alarms • Observes RCIC Isolation valves have failed to close. • Places 2E51-F007, RCIC Isolation valve switch to Close. • Places 2E51-F008, RCIC Isolation valve switch to Close. • Notifies SRO of RCIC valve failures. • May notify Maintenance for assistance in closing RCIC valves if SRO does NOT.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 8 Page 19 of 28

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior

	BOP	• Respond to annunciator LEAK DET DIFF TEMP HIGH, (601-321).
		• Addresses 2G31-R604 OR 2G31-R608 on 2H11-P614.
		• Identifies the following points on R604 increasing:
		  • 113, TORUS NW WALL is ~ 112°F
		  • 114, TORUS SE WALL is ~ 97°F
		  • 115, TORUS VENT AIR DIFF is ~ 31°F
		  • 116, TORUS VENT AIR DIFF is ~ 18°F
		• Identifies the following points on R608 increasing:
		  • 115, TORUS WEST WALL is ~ 112°F
		  • 116, TORUS NE WALL is ~ 98°F
		  • 117, TORUS VENT AIR DIFF is ~ 31°F
		  • 118, TORUS VENT AIR DIFF is ~ 18°F
		  • 119, MAIN STEAM TNL ~ 140°F
		• Reports temperatures to the SRO.

	SRO	• Enters the SC flow chart.
		• Progresses down each path.
		• Proceeds down the SC/T path, directing:
		  • All available area coolers are operated
		  • Operate the refueling floor ventilation
		  • Operate the reactor building ventilation
		  • Isolate all systems discharging into the area except those needed for ACC, shutdown the reactor, suppress a fire, maintain primary containment

	SRO	• Orders the reactor shutdown before any area exceeds Max Safe operating temperatures or delta temps since a primary system (RCIC) is discharging into Secondary Containment. (May direct this prior to Max Safe received).

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 8

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
	SRO	• Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • Enters 31EO-EOP-010-2, RC EOP flow chart if RWL decreases below 3 inches or if any area exceeds Max Safe. • Directs RWL Band of 3 to 50 inches.

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to shutdown.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • If not tripped, places the Recirc pumps at minimum speed.
		  • Inserts SRMs and IRMs.
		  • Shifts recorders to read IRMS, when required.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 8 Page 21 of 28

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior
	BOP	• Performs RC-2 actions consisting of: • Confirms proper Level Control response: • Checks ECCS Injection Systems (will not be in service if RWL >-35 inches) • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value • If Set down does not auto function, manually reduces FW Master Controller setpoint to approximately 9 inches. • When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then: • Confirms/Opens 2N21-F125. • Confirms/places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches. • Closes 2N21-F110. • If RFPTs are no longer available, will transition to HPCI to control RWL.
	BOP	• If necessary, starts HPCI for level control by performing the following at 2H11-P602 panel: • If required, depresses High Water Level Reset P/B • Opens 2E41-F059 • Starts Barom Cndsr Vac Pump • Opens 2E41-F001 • Starts Aux Oil Pump • Opens 2E41-F006 • Confirms TCV and • Confirms/Closes 2E41-F012 at flow > 790 gpm • Adjusts controller for desired flow and with SRO permission will raise RWL to 32 to 42 inches

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 8

Event Description: Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram. RCIC Group 4 signal failure.

Time	Position	Applicant's Actions or Behavior

	BOP	• Performs RC-3 consisting of:
		  • Monitoring RPV pressure.
		  • Confirms proper operation of pressure control system (TBV, LLS, etc.), at 2H11-P650 panel, by confirming TBVs are responding to control reactor pressure at the desired pressure setpoint.
		  • Maintains RPV pressure between 1074 and 800 psig until a different band is directed.
		  • Notifies SRO of pressure control system operation.
		
		  • If the MSIVs are still open, SRO orders "Anticipate Emergency Depress, then the operator will perform the following:
		  • At P650 HMI screen,
		  • Selects "Control"
		  • Selects "Bypass Valve"
		  • Inserts "Ramp Rate" of 100 then OK
		  • Inserts BPV position of 100 then OK
		  • Ensures Bypass Valve Jack Status is Active (controlling)
		  • Notifies SRO that Bypass Valves are opening

	SRO	• May order a lower Reactor pressure band to reduce the driving head. • May direct an operator to perform Rx Power, Level, and Pressure control, so that the other operator can address Secondary Containment parameters.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 9

Event Description: Emergency Depress when Max Safe exceeded in more than one area.

Time	Position	Applicant's Actions or Behavior
	ATC	• Provides periodic updates on temperature readings and delta temp readings to the SRO. • Reports R604 points 115 is above Max Safe. • Reports R608 points 120 & 117 are above Max Safe. • When a second temperature or delta temp exceeds Max Safe levels, informs the SRO.
	SRO	Transitions to CP-1 and orders 7 ADS valves open for Emergency Depress.
		Simulator operator the next event was activated at the beginning of the scenario.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 10 Page 24 of 28

Event Description: ADS valves (4) fail to open when Emergency Depress is required.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, failure of SRVs A, E, L and M to Open, have been active since the start of scenario.
	ATC	• Places 7 ADS valves control switches to OPEN. • Determines that four ADS valves did not open. (May initially only discover 2 failed valves, if one of the failed valves has lifted earlier in the scenario and the amber light is still lit, but SPDS will show ONLY 3 valves open.) • Either informs SRO or continues opening SRVs until 7 SRVs are open, then notifies SRO of 7 SRVs open and failure of 4 SRVs to open. (Critical Task) ***NOTE:*** *Critical Task – Open 7 SRVs when Max Safe exceeded in more than one area. Critical task is met when at least 5 SRVs have been opened.*
		NOTE: *If reactor pressure is below approximately 300psig, the SRV amber lights will not illuminate for SRV position confirmation. The operator can verify that the SRVs have opened by observing SRV tailpipe temperature increase.*
	SRO	• If the Operator notifies the SRO that 4 SRVs will not open and that only 3 are open, the SRO directs the operator to open 4 more SRVs or to Open SRVs until 7 are open. • The amber lights for the SRVs will not illuminate if pressure has been reduced to below approximately 300 psig. In this case the operator must use 2H11-P614 recorder indication to monitor tail pipe temperatures for the SRVs to verify the valves actually opened (Recorder 2B21-R614). **NOTE:** At low reactor pressure, the SRV amber lights may not illuminate and the SRO may direct all SRV switches to be placed in the OPEN position.

Op-Test No.: 2013-301 **Scenario No.:** 8-02 **Event No.:** 10

Event Description: ADS valves (4) fail to open when Emergency Depress is required.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• Depending on Reactor Water Level prior to opening ADS valves, RWL may swell to above 60 inches, requiring the operator to enter 34AB-C32-001-2, Reactor Water Level Above 60 inches. Operator secures all injection other than CRD.
		With Chief Examiners Permission the Scenario will be terminated when Reactor pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.:** 8-02 **Op-Test No.:** 2013-301

Initiating Conditions:	Unit 2 is at 90% power. 4160V 2F is on Alternate Supply from SAT 2C.
Turnover	Transfer 4160V 2F from alternate, SAT 2C, to normal, SAT 2D, IAW 34SO-R22-001-2. Once complete, increase reactor power to 95%.

Summary:

- **Event 1**: Normal; Transfer 4160V 2F from alternate, SAT 2C, to normal, SAT 2D, IAW 34SO-R22-001-2.
- **Event 2**: Reactivity; Raise Reactor power to 95% using Recirc.
- **Event 3**: TS; The Backup SDV valves will close due to a small air leak on 2C11-F040 requiring the SRO declare a TS Required Action Statement.
- **Event 4:** Component; The "2C" Station Service Air Compressor (SSAC) will receive a high discharge air temp alarm. The operator will start the 2A & 2B SSAC's and shutdown 2C SSAC.
- **Event 5:** Component/TS; RCIC will experience an inadvertent start with Trip pushbutton failing to trip RCIC. Operator will shutdown RCIC by either; closing T&TV, isolating steam to RCIC or placing flow controller in manual and lowering speed to prevent injection.
- **Event 6**: Component; Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start. The operator takes manual control to place the Standby Exhaust fan or SBGT in service to re-establish the required Reactor Building DP. **(Critical Task)**
- **Event 7:** Component; RFPT Bearing oil pressure low will be received. BOP will manually start the standby AC oil pump. Local report of oil leak and low oil pressure will require the RFPT to be manually tripped.
- **Event 8:** Major; Unisolable RCIC Steam leak in Reactor Building requiring a Reactor Manual scram.
- **Event 9:** Major; Since a RCIC Group 4 signal failure exists an Emergency Depress when > Max Safe in more than one area. **(Critical Task)**
- **Event 10:** Component; Four (4) ADS valves fail to open when Emergency Depress is required. The ATC will open an additional (4) valves to establish seven (7) SRVs open. **(Critical Task)**

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.:** 8-02 **Op-Test No.:** 2013-301

Critical Tasks

- Manually start the standby Reactor Building Exhaust fan or SBGT to return Reactor Building DP to a more negative value. **(Event 6)**
- Emergency Depress when > Max Safe in more than one area. **(Event 9)**
- The ATC will open an additional (4) valves to establish seven (7) SRVs open. (need at least 5 SRVs) **(Event 10)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	7	1. 2C SSAC high discharge air temp **(Event 4)** 2. RCIC inadvertent start with p.b. fails **(Event 5)** 3. Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start **(Event 6)** 4. RFPT Brg oil press low, manually start Stby AC oil pump, leak, RFPT tripped **(Event 7)** 5. Unisolable RCIC Steam leak in Reactor Building **(Event 8)** 6. RCIC Group 4 signal failure **(Event 9)** 7. 4 ADS valves fail to open **(Event 10)**
2.	Malfunctions After EOP Entry	1-2	2	1. RCIC Group 4 signal failure **(Event 9)** 2. 4 ADS valves fail to open **(Event 10)**
3.	Abnormal Events	2-4	3	1. RCIC inadvertent start with p.b. fails **(Event 5)** 2. Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start **(Event 6)** 3. Unisolable RCIC Steam leak in Reactor Building **(Event 8)**
4.	Major Transients	1-2	2	1. Unisolable RCIC Steam leak in Reactor Building **(Event 8)** 2. RCIC Group 4 signal failure **(Event 9)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) **(Event 8)** 2. SC/RR **(Event 8)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP-1 **(Event 9)**
7.	Critical Tasks	2-3	3	1. Reactor Building Exhaust fan failure with the Standby Exhaust fan failing to start **(Event 6)** 2. RCIC Group 4 signal failure **(Event 9)** 3. 4 ADS valves fail to open **(Event 10)**

ILT-8 NRC Operating Exam Scenario 2

SHIFT TURNOVER

Target ZERO — Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 90% RTP. 4160V 2F is on Alternate supply from SAT 2C. Activities in progress: Maintaining 90% RTP.

Protected Train:

- ☒ Division I
- ☐ Division II

EOOS:

- ☒ Green
- ☐ Yellow
- ☐ Orange
- ☐ Red

Scheduled evolutions:	☐ Transfer 4160V 2F from alternate, SAT 2C, to normal, SAT 2D, IAW 34SO-R22-001-2. ☐ Once complete, increase reactor power to 95%.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ None
Active tagouts:	☐ None
Rod Configuration:	☐ See RWM

Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I Hatch **Scenario No.:** 8-03 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 75% RTP. Crew is preparing to swap Cooler Condensers in the Off Gas System.

Turnover: Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2. After swap increase reactor power to 80% RTP.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2.
2	mfB21_123A	C (BOP) TS (SRO)	Small leak on a Main Steam line in the DW requiring SBGT to vent DW.
3	mfC11_30A mf60311334	I (ATC)	CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure.
4	mf65702234 mf65402051	C (BOP) TS (SRO)	Hi dP & Low flow on SBGT train requiring swapping to other SBGT.
5	mfB31_41B	C (ATC) TS (SRO) R (ATC)	Recirc Pump '2B' High Vibration requiring reducing reactor power in an attempt to clear alarm. Alarm remains in until pump is tripped. Insert Control Rods to exit RPI.
6	mfB21_123A	M (ALL)	Leak on Main Steam line in the DW worsens causing Drywell LOCA signal.
7	mfE11_202B	C (BOP)	RHR LOCA logic failure – manual actions are required for proper RHR operation. (Critical Task)
8	diE11-F016A diE11-F016B	C (ATC)	RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 1 Page 2 of 26

Event Description: Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2.

Time	Position	Applicant's Actions or Behavior
10 Min	SRO	Directs BOP to swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2.
		The BOP will perform the following at 2N62-P001 panel.

	BOP	• Monitors 2N62-R605, Glycol Pump Disch pressure indicator, and starts the idle 2N62-C001B, Glycol Sys Pump B, as necessary.
		• Opens the following valves:
		  • 2N62-F026B, Glycol Sys To Cndsr B
		  • 2N62-F071B, Glycol Sys From Cndsr B
		
		Simulator Operator, at the Chief Examiner's direction, when BOP is waiting for 15 minutes to elapse before opening 2N62-F025B, inform the BOP using Time Compression that 15 minutes has elapsed.
		  • 2N62-F025B, Clr Cndsr B Inlet

		Alarm, INLET FLOW TO STACK HIGH, (P600-020), may be received and will clear when the "A" side valves are closed.

	BOP	• Closes the following valves:
		  • 2N62-F026A, Glycol Sys To Cndsr A
		  • 2N62-F071A, Glycol Sys From Cndsr A
		  • 2N62-F025A, Clr Cndsr A Inlet
		  • If the second Glycol pump was started, stops 2N62-C001B, Glycol Sys Pump B
		  • Confirms Glycol Pump discharge pressure remains at 10 to 20 psig, on 2N62-R605, Glycol Pump Disch pressure
		  • Notifies SRO that the Cooler Condensers have been swapped

		Simulator Operator – Continue with the next event at the Chief Examiners request.

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Event Description: Small leak on a Main Steam line in the DW requiring SBGT to vent DW

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator, at the direction of the lead examiner, ENTERS: (**RB-2**) malfunction mfB21_123A final value of 0.0025 and ramp of 100.*
	ALL	• Receives Annunciators: • PRIMARY CNMT PRESSURE HIGH, (603-115) • PANEL 2H11-P657 SYSTEM TROUBLE, (650-224) • May receive MULTIPOINT TEMPERATURE RCDR, (657-025)
	SRO	• Directs the BOP to: • Enter 657-025 ARP • Monitor Drywell pressure • Vent the DW with SBGT, when DW pressure approaches 0.65 psig • Enter 34AB-T23-002-2, Small Pipe Break Inside Primary Containment (may give this to the ATC since BOP will be at back panel) • Directs Operator Check DW Leakage per 34SV-SUV-019-2.
		NOTE: *The operator may place Drywell venting in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The 2A or 2B SBGT Train may be used. The following steps are written assuming "2A" Train is used. If "2B" Train is used, substitute "2B" for "2A" for valves and the alarm numbers in parenthesis.* *Simulator Operator, ENSURE **ET-T46-13** & **ET-T46-14** have ACTIVATED.*
	BOP	• Confirms Temperature is elevated on 2T47-R626 recorder • Enters 34SO-T48-002-2, "Containment Atmosphere Dilution System" or uses placard to vent the Drywell. • Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2A. • Opens 2T46-F001A (1B) or 2T46-F003A (3B) • Places 2A (2B)SBGT Fan control switch to "RUN" • Alarm SBGT 2A (2B) SWITCH NOT IN AUTO, (657-091) (654-076), will be received • Confirms 2T46-F002A (2B) OPENS • Confirms SBGT 2A (B) Heater red light illuminates • Confirms SBGT 2A (B) flow on recorder 2T41-R618 Point 5 (2U41-R600 Point 3)

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 2 Page 4 of 26

Event Description: Small leak on a Main Steam line in the DW requiring SBGT to vent DW

Time	Position	Applicant's Actions or Behavior

	BOP	• Opens 2T48-F334A or 2T48-F334B (both valves may be opened)
		• The following alarms will be received:
		  • DRYWELL VENT EXHAUST BYPASS VALVES OPEN, (657-008)
		  • DRWL/TORUS N2 M/U 2 INCH ISOL VALVES OPEN, (657-042)
		  • DRYWELL VENT EXHAUST BYPASS VALVES OPEN, (654-002)
		  • DRWL/TORUS N2 M/U 2 INCH ISOL VALVES OPEN, (654-035)
		• Opens 2T48-F335A or 2T48-F335B(both valves may be opened)
		• Opens 2T48-F336A or 2T48-F336B. (both valves may be opened)
		• Monitors DW pressure.

	SRO	• If DRYWELL PRESS HIGH, (602-210) alarm is received, may direct the operator to fast vent the Drywell IAW 34SO-T48-002-2.
	BOP/ATC	• If directed, enters 34SO-T48-002-2, to fast vent and confirms the following alarms are NOT illuminated
		• SBGT/DRYWELL AND TORUS RADIATION HIGH (601-402) • FISSION PRODUCT PARTIC RADN HIGH/INOP (602-406) • FISSION PRODUCT IODINE RADN HIGH/INOP (602-412) • FISSION PRODUCT GAS HIGH/INOP (602-418) • CONTAINMENT RADIATION HIGH/INOP (602-436)
		• Opens 2T48-F319, Drywell Vent Vlv (2H11-P602). • Opens 2T48-F320, Drywell Vent Vlv (2H11-P601). • When Drywell pressure is < 0.5 psig on 2T48-R607A OR 2T48-R607B, close 2T48-F320, Drywell Vent Vlv. • Closes 2T48-F319, Drywell Vent Vlv.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 2 Page 5 of 26

Event Description: Small leak on a Main Steam line in the DW requiring SBGT to vent DW

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• Enters 34AB-T23-002-2 and attempts to identify the location of the pipe break including: • Instrumentation lines • RWCU (may remove from service and isolate by tripping RWCU 2B and then closing 2G31-F001 and/or 2G31-F004) • Recirc Pump seals • HPCI • RCIC • SRV Tailpipe Vacuum Breakers malfunctioning • Feedwater line break indication • Notifies SSS to perform 34SV-SUV-019-2, DW Leakage check.
		Simulator Operator, after 3 minutes as the operator checking DW leakage, reports that DW Equipment drain leakage is stable at 1.7 gpm and that Floor drain leakage has increased from 0.8 gpm to 10.1 gpm.
	SRO	• Enters Tech Specs 3.4.4, RCS Operational Leakage, Condition A and Condition B to reduce leakage to within limits in 4 hours.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 3 Page 6 of 26

Event Description: CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure

Time	Position	Applicant's Actions or Behavior
10 Mins		*At the Chief Examiner's direction, Simulator Operator enters (**RB-3**) malfunction mf60311334 CRD A Suction Pressure Low alarm. ENSURE Event Trigger **ET C11-2** ACTIVATES when CRD A Suction Pressure Low alarms.*
	ATC	• Recognizes the following occurs: • CRD PUMP A SUCTION PRESSURE LOW, (603-146) alarms • CRD PUMP 2A BREAKER TRIP, (603-128) alarms • CRD pump 2A is tripped • CRD HYD TEMP HIGH, (603-140) alarms • CRD ACCUMULATOR PRESS LOW OR HIGH, (603-148) alarms ~ 1.5 minutes later (will NOT alarm if CRD 2B is started expeditiously).
	SRO/ATC	• Dispatches SO/Maint to determine the cause of the low suction pressure condition for CRD pump 2A.
	SRO	• Directs the ATC to enter 34AB-C11-001-2, Loss of CRD, and start CRD pump 2B.
		NOTE: *The Abnormal procedure requires charging water header to be restored within 20 minutes.*
	ATC	• Enters 34AB-C11-001-2, Loss of CRD • Places 2C11-R600, CRD Flow Control, in Manual • Decreases 2C11-R600 output to zero • Manually starts CRD pump 2B • CHARGING WATER PRESSURE HIGH, (603-139) may come in and then clear on pump start • Increases system flow to ~50 gpm • Transfers 2C11-R600 to Automatic • Notifies SRO CRD pump 2B is in service • May place CRD pump 2A switch to stop, which clears CRD PUMP 2A BREAKER TRIP, (603-128) alarm.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 3 Page 7 of 26

Event Description: CRD pump trips due to low suction pressure instrument failure. Must start standby pump to restore system flow & pressure

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	• Dispatches an SO to check CRD temperatures and Accumulator pressures locally.
		Simulator Operator, if dispatched to check Accumulator pressures, wait until after CRD pump 2B is started AND ALL Accumulator alarms are clear, THEN report all accumulator pressure are > 980 psig.
	SRO	May review TS 3.1.5 for inop accumulators and since all accumulator pressures are > 980 psig, does NOT declare any accumulators inop.
		Simulator Operator reports that: • *If the CRD High Temp Alarm is still lit, report that 1 CRD drive (26-35) is > 250°F* • *If the CRD High Temp Alarm is NOT lit, report that all temps are < 250°F* • *Suction pressure for CRD pump 2A is 22 psig and there is no apparent problem with the suction line-up or suction filter.*
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 4 Page 8 of 26

Event Description: Hi dP on SBGT train requiring swapping to other SBGT

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator, at the direction of the Chief Examiner, ENTERS: (**RB-4**) malfunction mf65702234 2A SBGT Filter Diff Pressure High alarm and override 2T46-R603A **OR** mf65402051 2B SBGT Filter Diff Pressure High alarm and override 2T46-R603B.* *THE MALFUNCTION WILL BE DECIDED BY WHICH SBGT FAN IS FIRST STARTED USING **ET-T46-13 & ET-T46-14**.*
		NOTE: The operator may start either 2A or 2B SBGT Train. The following steps are written assuming "2A" Train is used. If "2B" Train is used, substitute "2B" for "2A" for valves and the alarm numbers in parenthesis.

	ALL	• Alarms received:
		  • P657 SYTEM TROUBLE, (650-224) (P654 SYSTEM TROUBLE, (650-214))
		  • 2A SBGT FILTER DIFF PRESS HIGH, (657-055), (2B SBGT FILTER DIFF PRESS HIGH, (654-046))

	BOP	• Enters 657-055 (654-046)
		  • Confirms Filter differential pressure > 5.7" WG as indicated on 2T46-R603A (B) (2H11-P700)
		  • Notifies SRO of high differential pressure on SBGT 2A (2B)
		  • Since Filter differential pressure is > 5.7" WG and continued SBGT operation is required, determines SBGT 2B (2A) fan is required to be started and 2A (2B) needs to be secured. (SRO may direct)
		  • Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2B (2A).
		  • Opens 2T46-F001B (1A) or 2T46-F003B (3A)
		  • Places 2B (2A) SBGT Fan control switch to "RUN"
		  • Alarm 2B SBGT SWITCH NOT IN AUTO, (654-076). is received
		  • Alarm 2A SBGT SWITCH NOT IN AUTO, (657-091), is received
		  • Confirms 2T46-F002B (2A) OPENS
		  • Confirms SBGT 2B (2A) Heater red light illuminates.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 4

Event Description: Hi dP on SBGT train requiring swapping to other SBGT

Time	Position	Applicant's Actions or Behavior
	BOP	• Secures SBGT 2A (2B) • Confirm "SBGT AUTO SIGNAL PRESENT" annunciator is RESET • Place SBGT 2A (2B) in the AUTO position • Depress SBGT A (B) Fan/Htr Auto-Start Reset pushbutton • Confirm Green HTR OFF light illuminates • Confirm 2T46-F002A (2B) closes • Confirm closed OR close 2T46-F003A (3B) • Confirm closed OR close 2T46-F001A (1B) • Confirm that annunciator P657-093 (P654-078) is NOT in the alarm condition • As time permits, refers To 34SO-T46-001-2 AND place SBGT in Standby per subsection 7.1, Standby - Ready For Auto Start
	SRO	• Based on the alarms received and indications, • Directs BOP to swap SBGT fans. • Notifies Maintenance of high dP • Addresses Tech Specs: • 3.6.4.3, Standby Gas Treatment System Condition B, requires to; Restore required SGT subsystem to operable status within 7 days AND 30 days from discovery of failure to meet the LCO.
		NOTE: If time does NOT permit, the examiner may have to ask the SRO for the SBGT 2A/2B Tech Spec after the scenario is over.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 5

Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
18 Min		***Simulator Operator*** *At Chief Examiner's direction, press (**RB-5**) to activate:* • *mfB31_41B, Recirc Pump B High Vibration*
	ALL	• Receives RECIRC PUMP B HIGH VIBRATION, (602-204) alarm
	ATC	• Enters 602-104
		• Depresses the Hi vibration reset pushbutton and determines that the alarm does NOT clear. • Notifies the SRO that the vibration alarm did NOT clear. • Notifies the SRO that the ARP requires reducing Recirc flow and attempting to reset the alarm again.
	SRO	• Directs the operator to reduce Rx power with Recirc per 34GO-OPS-005 and 34SO-B31-001-2, section 7.1.6 "Two Loop Operation From Rated To Minimum Speed", exceeding 10 MWE/minute if necessary. • Reminds the operator that entry into the immediate exit region of the Power to Flow map is allowed. • Notifies Plant Management, Load Dispatcher, and Engineering that the power increase has been halted pending investigation of Recirc Pump 2B high vibration condition.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 5 Page 11 of 26

Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior

	ATC	• Enters the following procedures
		• 34GO-OPS-005-2, "Power Changes"
		• 34SO-B31-001-2, "Recirculation System"
		  • IAW 34SO-B31-001-2, the ATC decreases Recirc pump speed by depressing the Slow, Medium or Fast LOWER pushbuttons on the Master or Individual controls.
		  • Monitors power decrease by observing APRM and generator output indications.
		  • Stops power reduction periodically and depresses the High vibration reset pushbutton.
		  • The alarm will NOT remain clear until the pump is tripped.
		  • Continues to decrease BOTH Recirc pump speeds until minimum
		  • Notifies SRO when BOTH Recirc Pumps are at minimum.
		  • Notifies the SRO that the vibration alarm DID NOT clear after reducing BOTH Recirc pumps.
		  • Notifies SRO of entering Region of Potential Instabilities/Immediate Exit Region of Power to Flow Map.

	BOP	Notifies chemistry of 15% power change in 1 hour IAW 34GO-OPS-005-2, "Power Changes", Step 5.2.13.
		EXAMINER NOTE: *Log time when Region of Instabilities/Immediate Exit Region has been entered.* **Time:** _____
		NOTE: *HEATER TROUBLE ALARM, (650-135) may alarm due to plant conditions.* ***NOTE:*** *15% power change sample required IAW limitation 5.2.13, 34GO-OPS-005-2.*
	SRO	• Directs the ATC operator to shutdown the B ASD IAW 34SO-B31-001-2 section 7.2.1.4, "Abnormal Recirc Pump/ASD B Shutdown". • As time allows, directs the BOP operator to secure one Condensate and one Condensate Booster Pump plus one RFPT.

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Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
	ATC	• Place ASD B control switch 2B31-S002B to Pull to Lock **OR** depresses the ASD B Shutdown pushbutton and places ASD B control switch to Pull to Lock on panel 2H11-P602. • Enters 34AB-B31-001-2, "Reactor Recirculation Pump(s) Trip, Recirc Loops Flow Mismatch, Or ASD Cell Bypass" for single Recirc pump trip.
	TIME	• Closes 2B31-F031B, Pump Disch Valve.
	TIME	• Within 5 minutes, throttles 2B31-F031B, Pump Disch Valve OPEN
		• Acknowledges the following annunciators: • ASD B TRIP WARNING, (602-201) • ASD B FATAL FAULT, (601-202) • ASD B TROUBLE, (601-208) • RECIRC LOOP B OUT OF SERVICE, (601-227)
		NOTE: *IAW 34AB-B31-001-2, During single loop operation, WHEN the speed of the running pump decreases below approximately 35% speed, positive flow through the idle pump loop due to natural circulation overcomes the negative flow due to reverse flow. The total core flow summing circuitry will continue to subtract this positive idle loop flow from the running loop flow AND give a misleading LOW core flow indication. Total core flow can be calculated by adding the JET PUMP LOOP "A" AND the JET PUMP LOOP "B" flows.*
	SRO	• Has the operator determine if the plant is in the analyzed region of the Power to Flow map.
	ATC	• Determines that the plant is in the Immediate Exit Region of the Power to Flow map.

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Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
		NOTE: *IF the crew makes a conservative decision to shut down the Reactor, with Chief Examiners permission, PROCEED to the MAJOR EVENT.*
	SRO	Performs the following:
	TIME	• **Within 15 minutes** of entering the Immediate Exit Region of the Power to Flow map, directs operator to exit the region by inserting control rods. (*Time is stopped when CR movement brief is started*)
	TIME	• Ensures the plant has **exited** the Immediate Exit Region of the Power to Flow map **within one hour**. (*Time is stopped when region is exited*)
		• Has a control rod movement brief per 34GO-OPS-065-0 • Directs ATC operator to insert rods to exit the Power to Flow Map "Immediate Exit Region".
		NOTE: *Advise the STA to recommend inserting the current rod group to its insert limit.*
	SRO	• Directs the operator to insert the rods to the insert limit after consulting with the STA. • References Tech Spec 3.4.1.A.1 and has 24 hours to meet requirements for Single Loop Operation.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 5

Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
		Simulator Operator *If the Team calls for the STA or Reactor Engineering, for rod movement recommendations:* • *Respond as follows:* • *"Use the Reactivity Manipulations Turnover."* ***NOTE:*** *RBM Downscale alarm may alarm during this movement due to the significant rod worth of these rods. It is allowed to flag the RBM Downscale and Rod Block alarm.*
	ATC	• Inserts control rods per 34GO-OPS-065-0, starting with control rod Group 52. • During rod insertion, rod steps will be performed in reverse sequential order, starting at the highest numbered step. (** rod steps are NOT required to be performed sequentially, but must be positioned to their RWM insert limit prior to inserting lower numbered groups). • Selects Rod • Places Control Rod movement switch to the IN position • Verifies Rod moves using Rod display information and Rx and Generator power decreasing.
	ATC	• If required, adjust 2C11-F003 to get 220 – 280 psid drive water dp.
	ATC	• Releases Rod movement switch so that the control rod stops 1 position before the insert limit unless the insert limit is 00. • Initials Rod movement Sheet. • Verifier, if available, Initials Rod movement sheet. • Notifies the SRO when they are out of the region of potential instabilities.

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Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
	BOP	• Removes condensate pumps (CP & CBP) from service prior to CBP discharge pressure < 525 psig OR power <70% OR as soon as practical. • For removal of CBP • If 2C is to be removed, removes the Hydrogen Injection System from service • Sends SO to closed selected pumps discharge valve • Prior to discharge valve being full closed, trips pump and places control switch in Auto or PTL • Has SO complete the procedure • Removal of CP • Sends SO to closed selected pumps discharge valve • Trips pump and places control switch in Auto or PTL • If pump left in Standby, has SO reopen discharge valve
		NOTE: *IAW 34GO-OPS-005-2, "WHEN Feedwater flow is less than 7 mlbm/HR AND two Reactor Feed Pumps are running, one Reactor Feed Pump MAY be shutdown*
	BOP	Enters 34SO-N21-007-2, "Condensate And Feedwater System", section 7.2.1"First Reactor Feed Pump Shutdown and Leaving in Standby".
		• Confirms Feedwater Flow is less than 7 Mlbm / hr. • Confirms RFPT 2A AND RFPT 2B are in Automatic control on 2C32-R600, Master Controller. • Places 2C32-R601A (2C32-R601B), RFP A (B) M/A Station, in Manual, by depressing the 'M' pushbutton until it illuminates, panel 2H11-P603. • Slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until the other RFP is controlling reactor vessel level. ***NOTE:*** *At this point the operator may stop here with the RFPT NOT injecting and continue with this section as time allows.*

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Event Description: Recirc Pump '2B' will experience high vibration

Time	Position	Applicant's Actions or Behavior
		• When the other RFP has control of water level, slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until no speed decrease is observed AND/OR place the RFPT A (B) TMR switch to SS AND confirm Speed Setter yellow light illuminates. • Slowly lower RFPT 2A (2B) Speed Setter switch until RFPT speed is at 1000 rpm, at 2H11-P650. • IF desired, reduce the RFPT 2A (2B) speed to minimum AND allow the RFPT to "windmill", provided seal water, steam seals, AND lube oil systems remain in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 6 Page 17 of 26

Event Description: Steam line breaks inside Drywell

Time	Position	Applicant's Actions or Behavior
25 Min		*At the Chief Examiner's direction, Simulator operator MODIFY mfB21_123A to Final value of 0.1 with ramp of **1000***
	ALL	• Determines that DW pressure is increasing and approaching 1.85 psig.

	SRO	• Orders the Rx manually scrammed (may NOT have time to insert manual scram before the Rx auto scrams).
		• Directs ATC to perform RC-1 placard
		• Directs BOP to perform RC-2 and RC-3 placards
		• Enters RC EOP Flowchart
		• As time allows,
		  • Dispatches personnel to the EDGs to check for proper operation.
		  • Directs reopening 2P41-F316A-D IAW 34AB-P41-001-2, Loss of PSW

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to shutdown.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • If NOT tripped, places the Recirc pumps at minimum speed.
		  • Inserts SRMs and IRMs.
		  • Shifts recorders to read IRMS, when required.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 6

Event Description: Steam line breaks inside Drywell

Time	Position	Applicant's Actions or Behavior

	BOP	• Performs RC-2 actions consisting of:
		• Confirms proper Level Control response:
		  • Checks ECCS Injection Systems and secure as necessary.
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value.
		  • IF set down does NOT auto function, then manually reduces FW Master Controller setpoint to approximately 9 inches.

	BOP	• When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125.
		  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Closes 2N21-F110.
		  • Trips One RFPT.
		  • Controls RWL with RFPTs, HPCI and/or RCIC.
		  Notifies SRO if RWL gets outside assigned band.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 6 Page 19 of 26

Event Description: Steam line breaks inside Drywell

Time	Position	Applicant's Actions or Behavior
		• Secures HPCI as follows: • Either, • Places HPCI Controller in Manual and lowers output to prevent injection and then performs the following: OR: • Depresses and holds the HPCI Turbine Trip push-button. • Receives the following: • HPCI TURBINE TRIP, (601-103) • HPCI TURBINE TRIP SOLENOID ENERGIZED, (601-109) • HPCI PUMP DISCHARGE FLOW LOW, (601-231) • When HPCI turbine has stopped, places the HPCI Aux Oil Pump in Pull To Lock off. • Receives HPCI TURBINE BRG OIL PRESS LOW, (601-112) • When HPCI TURBINE BRG OIL PRESS LOW, (601-112) alarm is received, releases the HPCI Turbine Trip push-button. • HPCI TURBINE TRIP SOLENOID ENERGIZED, (601-109) clears.
	ATC	• Re-opens 2P41-F316s due to high oil temp on the RFPTs per 34AB-P41-001-2, Loss of PSW, Placard. • Places the "A" and "B" Isolation Override switches on the 2H11-P652 panel to Override • Fully opens 2P41-F316A or C and 2P41-F316B or D • Throttles 2P41-F316C or A and 2P41-F316D or B to open while monitoring PSW division 1 and 2 pressure on 2H11-P650 panel ensuring that PSW pressure remains above 80 psig. • Notifies SRO 2P41-F316s have been reopened.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 7 Page 20 of 26

Event Description: LOCA RHR signal failure – manual actions are required.

Time	Position	Applicant's Actions or Behavior
		NOTE: *mfE11_202B (LOCA Signal failure) was inserted at beginning.*
	SRO	• Enters 31EO-EOP-012-2, Primary Containment flow chart.
	BOP	• At panel 2H11-P601, Confirms the 4 RHR pumps did NOT auto start and ONLY 2 Core Spray pumps are running. • Notifies SRO of RHR pump logic failure and starts (Critical Task) the 4 RHR pumps.
	SRO	• Per the PC flowchart, verifies Torus level is <285 inches and directs an operator to place Torus Sprays in service.

	ATC	• Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows:
		  • Places Cnmt Spray Vlv Cntl switch in the Manual position. (NOT required, since LOCA signal failed, but procedurally okay)
		  • Verifies RHR pump(s) in loop A (B) running.
		  • Opens 2E11-F028A or B
		  • Opens 2E11-F027A or B
		  • Throttles Open 2E11-F027A(B)
		  • Notifies SRO that RHR is in Torus Sprays (The flow is only 700gpm, so it may be difficult to see flow indication from a distance.)

		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 8 Page 21 of 26

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, ENSURE Event Triggers **E11-4** & **E11-5** is ACTIVATED when the operator positions 2E11-F016A or B to open.*
	SRO	• When Torus pressure exceeds 11 psig, verifies that Torus Level is <215 inches, in the safe area of Graph 8 (DWSIL) and Directs an operator to: • Place the DW cooling fans to Off • Shutdown Recirc pumps (if running) • Spray the DW • As time allows, directs an operator to perform 31EO-EOP-114-2 for RHR & CS
	ATC	• Places the following DW cooling fans control switches in the OFF position: • 2T47-B007B, Drywell Cooling Top Head Area Unit • 2T47-B008B, Drywell Cooling Pedestal/Annular Area Unit • 2T47-B009B, Drywell Cooling Recirc Pump Area Unit • 2T47-C001B, Drywell Cooling Return Air Fan • 2T47-C002B, Drywell Cooling Return Air Fan • 2T47-B010B, Drywell Cooling EL 114 Unit • 2T47-B007A, Drywell Cooling Top Head Area Unit • 2T47-B008A, Drywell Cooling Pedestal/Annular Area Unit • 2T47-B009A ,Drywell Cooling Recirc Pump Area Unit • 2T47-C001A, Drywell Cooling Return Air Fan • 2T27-C002A, Drywell Cooling Return Air Fan • 2T47-B010A, Drywell Cooling EL 114 Unit • Notifies the SRO that the fans are Off.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 8 Page 22 of 26

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
	ATC	• Sprays the Drywell per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows: • Places Cnmt Spray Vlv Cntl switch in the Manual position. (not required, since LOCA signal failed, but procedurally okay) • Starts RHR pump(s) in loop A (B), if NOT already running. • Opens 2E11-F021A or B • Opens 2E11-F016A or B (ONE WILL NOT OPEN AND OPERATOR TRANSITIONS TO THE OTHER LOOP) • Informs SRO that the 2E11-F016A (or B) will NOT Open • Opens 2E11-F021A or B • Throttles Open 2E11-F016A(B) (Critical Task) to >5000 gpm • Confirms Drywell pressure is reducing • Notifies SRO that RHR is in Drywell Sprays
	BOP	Notifies the SSS to perform actions for RHR per 31EO-EOP-114-2. IAW 31EO-EOP-114-2, the operator performs the following: • CLOSES RHR OUTBD INJ VLV, 2E11-F017A • CLOSES RHR OUTBD INJ VLV, 2E11-F017B • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017A • Notifies SSS to OPEN links & INSTALL jumpers for 2E11-F017B • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017A • Confirms/CLOSES RHR OUTBD INJ VLV, 2E11-F017B • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005A • Confirms/CLOSES INBD DISCHARGE VLV, 2E21-F005B • Trips Core Spray pump A, 2E21-C001A • Trips Core Spray pump A, 2E21-C001B Notifies SRO 31EO-EOP-114-2 actions for RHR & CS are complete
	SRO	• As time allows, directs H2/O2 Analyzers placed in service IAW 34SO-P33-001-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-03 **Event No.:** 8 Page 23 of 26

Event Description: RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray

Time	Position	Applicant's Actions or Behavior
	ATC	• Places H_2/O_2 Analyzers in service IAW 34SO-P33-001-2 or "Placard" by performing the following at 2H11-P700 panel: • Confirms closed 2P33-F605 • Places 2P33-S16, LOCA Override to 'Bypass" • Places 2P33-S17, LOCA Override to 'Bypass" • Confirms analyzers are running by either red analyzer lights illuminated or values indicated on the Primary Display of SPDS • If analyzers red light is off, depresses Channel A and Channel B Reset pushbuttons on 2H11-P700 panel. • Notifies SRO H_2/O_2 Analyzers are running.
		With Chief Examiners Permission, the scenario should be terminated when the crew has sprayed the Drywell with the other Loop of RHR.

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.:** 8-03 **Op-Test No.:** 2013-301

Initiating Conditions:	Unit 2 is operating at 75% RTP. Crew is preparing to swap Cooler Condensers in the Off Gas System.
Turnover	Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2. After Cooler Condenser swap, increase reactor power to 80% RTP via Recirc.

Summary:

- **Event 1**: Normal; Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2
- **Event 2**: Component/TS; A Small leak on a Main Steam line in the DW requiring the BOP to place SBGT in service to vent DW. DW Floor drain leakage will be above TS limits.
- **Event 3**: Instrument; The 2A CRD pump will trip due to a low suction pressure instrument failure. The ATC will be required to manually start the standby CRD pump to restore system flow & pressure.
- **Event 4:** Component/TS; The operating train of SBGT will experience a Hi dP condition requiring the BOP to swap to the other SBGT train. SBGT will be declared inop.
- **Event 5:** Component/TS/Reactivity; Recirc Pump '2A' will experience high vibration requiring reducing reactor power in an attempt to clear the alarm. Alarm remains in until pump is tripped. The SRO addresses TS for an inoperable Recirc pump. The plant will be operating in the Immediate Exit Region of the Power-to-Flow map. The ATC operator will insert control rods to exit the Immediate Exit Region of the P/F map.
- **Event 6**: Major; Steam line breaks inside Drywell causing LOCA.
- **Event 7:** Component; RHR LOCA logic failure requiring manual actions to place RHR in service. **(Critical Task)**
- **Event 8:** Component; When Torus pressure exceeds 11 psig, the operator will have to swap to the other loop of RHR to spray the Drywell, since one RHR DW spray valve will NOT open. The first DW spray valve attempted will NOT open but the other loop of RHR DW spray valve will work. **(Critical Task)**

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.:** 8-03 **Op-Test No.:** 2013-301

Critical Tasks

- RHR LOCA logic failure requiring manual actions for proper RHR Loop operation, when any mode of RHR operation is desired. **(Event 7)**
- RHR 2E11-F016A/B stuck closed requiring the operator to swap to other loop of RHR to spray the DW. **(Event 8)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	7	1. Small leak on a Main Steam line in the DW **(Event 2)** 2. CRD pump trips **(Event 3)** 3. Hi dP on SBGT train **(Event 4)** 4. Recirc Pump '2B' high vibration **(Event 5)** 5. Steam line worsens inside Drywell **(Event 6)** 6. RHR LOCA logic failure **(Event 7)** 7. RHR 2E11-F016A/B stuck closed **(Event 8)**
2.	Malfunctions After EOP Entry	1-2	2	1. RHR LOCA logic **(Event 7)** 2. RHR 2E11-F016A/B stuck closed **(Event 8)**
3.	Abnormal Events	2-4	4	1. Small leak on a Main Steam line in the DW **(Event 2)** 2. CRD pump trips **(Event 3)** 3. Hi dP on SBGT train **(Event 4)** 4. Recirc Pump '2B' high vibration **(Event 5)**
4.	Major Transients	1-2	1	1. Steam line worsens inside Drywell **(Event 6)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) flow chart **(Event 6)** 2. PC flow chart **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	0	
7.	Critical Tasks	2-3	2	1. RHR LOCA logic failure requiring manual actions to place RHR in service **(Event 7)** 2. RHR 2E11-F016A/B stuck closed requiring swapping to other loop of DW spray **(Event 8)**

ILT-8 NRC Operating Exam Scenario 3

SHIFT TURNOVER

Target ZERO — Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 74% power Activities in progress: Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Orange ☐ Yellow ☐ Red
Scheduled evolutions:	☐ Swap Cooler Condensers from 2N62-B003A to 2N62-B003B IAW 34SO-N62-001-2, step 7.2.2. ☐ After Cooler Condenser swap, increase reactor power to 80% RTP via Recirc.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ None
Active tagouts:	☐ None
Rod Configuration:	☐ See RWM

Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I. Hatch **Scenario No.:** 8-04 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. A Tornado watch has been issued by the National Weather Service for Southern Toombs and Northern Appling counties for the next 2 hours. Unit 2 is operating at 53% RTP and holding due to current weather conditions. SRV 2B inop for LLS.

Turnover: Unisolate RCIC, place in standby and then after the weather improves, increase reactor power to 65% RTP.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Unisolate RCIC and place in standby.
2	mfB21_130F	C (ATC) TS (SRO)	2F LLS SRV cycles open/close until fuses are pulled. (Critical Task)
3	mf70022416 (ON)	C (BOP)	Instrument Air System Prefilter dP Hi – swap Prefilters.
4	mfN21_88A	C (ATC)	RFPT loop seal failure
5	mfB21_229A ET-T46-01 ET-T46-02	C (BOP) TS (SRO)	Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. Suction valves for the first SBGT started will fail to open, must use opposite train to vent the Drywell.
6	mfS11_227A	R (ATC) TS (SRO)	Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.
7	mfB21_229A diC11B-S4A diC11B-S4B ET-C71-3	M (ALL)	Leak on the "A" FW line in the DW worsens/ruptures requiring a reactor shutdown. Small RWCU leak in DW.
8	diN21-F006A	C (BOP)	2N21-F006A fails to close requiring all Cond/FW isolated (Critical Task)
9	mfE51_61	M (ALL)	RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches. (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 1

Event Description: Unisolate RCIC and place in standby.

Time	Position	Applicant's Actions or Behavior
10 Min.	SRO	Directs BOP to unisolate RCIC and place in standby IAW 34SO-E51-001-2, RCIC System, starting at step 7.1.1.36.
		NOTE: *The RCIC Steam Line can be warmed and pressurized by performing either step 7.1.1.36.1 (2E51-F007)* *OR* *7.1.1.36.2 (2E51-F008).* *If the BOP chooses step 7.1.1.36.1, (2E51-F007), then the following steps are applicable.*
	BOP	Pressurizing RCIC steam supply with 2E51-F007: • Confirm closed 2E51-F007, Steam Supply Isol Valve • Opens 2E51-F008 Steam Supply Line Isol Valve • Opens 2E51-F054 Steam Line Drain Valve • Slowly throttles open 2E51-F007 Steam Supply Isol Valve • Fully Opens 2E51-F007 when turbine steam inlet pressure (2E51-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel) • Confirms RCIC ISOLATION VLV F007/F008 NOT FULLY OPEN, (602-336) alarm clears • Closes 2E51-F054, Steam Line Drain Valve, when alarm, RCIC TURBINE INLET DRAIN POT LEVEL HIGH, (602-308), clears • Completes Attachment 1 and notifies SRO to be verified
	SRO	Notifies SSS to complete verification of Attachment 1.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 1

Event Description: Unisolate RCIC and place in standby.

Time	Position	Applicant's Actions or Behavior
		NOTE: *The RCIC Steam Line can be warmed and pressurized by performing either step 7.1.1.36.1 (2E51-F007)* *OR* *7.1.1.36.2 (2E51-F008).* *If the BOP chooses step 7.1.1.36.2, (2E51-F008), then the following steps are applicable.*
		Pressurizing RCIC steam supply with 2E51-F008: • Confirm closed 2E51-F008, Steam Supply Line Isol Valve • Opens 2E51-F007 Steam Supply Isol Valve • Opens 2E51-F054 Steam Line Drain Valve • Slowly throttles open 2E51-F008 Steam Supply Line Isol Valve • Fully Opens 2E51-F008 when turbine steam inlet pressure (2E51-R602) is within 50 psig of reactor pressure on 2B21-R623A or B (P601 panel) • Confirms RCIC ISOLATION VLV F007/F008 NOT FULLY OPEN, (602-336) alarm clears • Closes 2E51-F054, Steam Line Drain Valve, when alarm, RCIC TURBINE INLET DRAIN POT LEVEL HIGH, (602-308), clears
	SRO	Notifies SSS to complete verification of Attachment 1.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 2

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
10 Mins		*At the Chief Examiner's direction, Simulator operator, INSTRUCT the BOP operator by phone to stay on the line until told to hang up, THEN ENTER (**RB-2**) malfunction mfB21_130F, 2F LLS valve intermittently cycling open and close. ENSURE Event Trigger **ET-B21-12** ACTIVATES. This SRV will cycle such that it is open for 15 seconds, then stays closed for 45 seconds, then repeats this cycle for 5 minutes or until fuses for SRV 2F are pulled.*
	ATC	• Receives SAFETY BLOWDOWN PRESSURE HIGH, (602-311) and SAFETY/BLOWDOWN VALVE LEAKING, (603-122) alarms
	SRO	Directs operator to enter 34AB-B21-003-2, Failure of Safety/Relief Valves • Enters a RAS for TS LCO 3.6.1.6.A for 2 or more LLS valves inop, which requires the unit to be in mode 3 in 12 hours and mode 4 in 36 hours. • Directs operators to verify that the SRV 2F is closed, after the fuses are pulled.
	ATC	• Enters 34AB-B21-003-2, Failure of Safety/Relief Valves • Determines SRV 2F is cycling open then close • Cycles the SRV 2F Control Switch several times • May depress the ADS Logic A Timer Reset pushbutton (2B21-S2A) • May depress the ADS Logic B Timer Reset pushbutton (2B21-S2B) • Depresses the LLS Channel A / C Reset pushbutton (2B21-S15A) • Depresses the LLS Channel B / D Reset pushbutton (2B21-S15B) • Informs SRO that SRV 2F is cycling and the fuses will have to be pulled for the valve • Notifies the SSS to pull the fuses for SRV 2F
	ATC	Receives DRYWELL/TORUS RCDR R627 TEMP HIGH, (650-204) alarm • Determines Torus Water Temp (Point 2) is high at 98°F • When the SRV is closed Point 2 starts decreasing.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 2

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, assuming that a request was made to pull fuses for SRV 2F, wait 4 minutes, then ENTER (**RB-8**), rfB21_305, to simulate pulling the fuses for SRV 2F, then DELETE mfB21_130F, 2F LLS Valve or Scenario **B21-12**.* *Then, Notify the crew that the fuses have been pulled for SRV 2F.*

	ATC	• Confirms that SRV 2F is closed by monitoring one or more of the following:
		  • SRV tailpipe temperature decrease (Directs BOP to P614 panel)
		  • Torus level stabilizing
		  • Torus Temp stabilizing
		  • Rx and Generator power returns to the pre-event level
		
		  • Resets the SRV leak detection by placing the Leak Detection Logic A Reset keylock switch and Leak Detection Logic B Reset keylock switch to Reset position and back to Normal position
		  • Confirms that the Amber SRV indicating lights have Extinguished
		  • SAFETY BLOWDOWN PRESSURE HIGH, (602-311), clears
		  • Informs the SRO that SRV 2F is closed.

	SRO/ATC	Informs the crew that operability of the suppression chamber-drywell vacuum breakers must be performed within 12 hours per 34SV-T48-002-2, Suppression Chamber To Drywell Vacuum Breaker System Operability. Notifies Chemistry and initiates a CR to initiate increased monitoring of vessel moisture content carryover per 64CH-SAM-025-0.
		*At this time, Torus temperature will still be below 95°F, therefore RHR is NOT required to be placed into Torus Cooling. The SRO may elect to place Torus Cooling in service, since steam was admitted to the Torus. The following steps are written **IF** the SRO elects to place Torus Cooling in service.*

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 2

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
		NOTE: The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.
	BOP	• Enters 34SO-E11-010-2, Residual Heat Removal • Places RHRSW in service • Prelube RHRSW pump • Overrides 2E11-F068B Low Discharge Pressure Interlock • Positions 2E11-F068B to 45% OPEN • Starts RHRSW pump B • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 gpm AND < 450 psig
	BOP	• IF desired to start a SECOND RHRSW pump, • Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM). • Opens 2E11-F068B an additional 5%. • Starts second RHRSW Pump. • Positions 2E11-F068B to obtain < 8800 gpm AND < 450 psig

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 2 Page 7 of 36

Event Description: SRV 2F (LLS) cycles open/close until fuses are pulled.

Time	Position	Applicant's Actions or Behavior
	BOP	• Places RHR B Loop in Torus cooling per the placard by performing the following steps: • Opens 2E11-F048B • Closes 2E11-F047B. • Opens 2E11-F003B. • Starts RHR Loop B pump • Receives alarm, RHR LOW FLOW, (601-222) • Opens 2E11-F028B • Receives alarm, AUTO BLOWDOWN CS OR RHR PRESS PERMISSIVE, (602-312) • Receives alarm, SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) • Throttles OPEN 2E11-F024B • Alarm, RHR LOW FLOW, (601-222), clears • Opens 2E11-F047B • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B • Notifies the SRO that RHR "B" loop is in service • May place the second pump in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 3 Page 8 of 36

Event Description: Instrument Air System Prefilter dP Hi – swap Prefilters.

Time	Position	Applicant's Actions or Behavior
7 Mins		*Simulator Operator at direction of the lead examiner, ACTIVATE: (**RB-3**) malfunction mf70022416 – Window 25 INSTRU AIR PREFLTR D103A DIFF PRESS HIGH (ANNUNCIATOR ON)*
	All	The following annunciators are received: • PANEL 2H11-P700 SYSTEM TROUBLE, (650-225) • INSTR AIR PREFLTR D103A DIFF PRESS HIGH, (700-225)
	BOP	• Acknowledges 2H11-P700 panel alarm on 2H11-P650 • Acknowledges INSTR AIR PREFLTR D103A DIFF PRESS HIGH, (700-225) on 2H11-P700 and notifies the SRO of the alarm • Dispatches an SO locally to determine Prefilter dP on 2P52-dPIS-N301A, look for air leaks on the filter and to verify that the instrument isolation valve is open.
		Simulator Operator: 2 minutes after being dispatched to check Prefilter dP, inform the BOP that 2P52-dpis-N301A indicates 6 psid and that no air leaks exist.
	SRO	• Notifies Maintenance (if BOP has not) to change out the Prefilter cartridge and initiates a condition report. • Directs the BOP to swap Prefilters IAW 34AR-700-225-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 3 Page 9 of 36

Event Description: Instrument Air System Prefilter dP Hi – swap Prefilters.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, WHEN the BOP swaps Prefilters, ENSURES EVENT TRIGGER **P51-1** & **P52-2** ACTIVATES: deleting malfunction mf70022416 – Window 25 INSTRU AIR PREFLTR D103A DIFF PRESS HIGH (ANNUNCIATOR ON) and simulates correct light arrangement.*
	BOP	At 2H11-P700: • Places control switch to ON for Turb Bldg Inst Air PreFltr/Afterfilter 2P52-D103B/2P52-D102B Inlet Isol, 2P52-F002B/2P52-F011B. • Places control switch to OFF for Turb Bldg Inst Air PreFltr/Afterfilter 2P52-D103A/2P52-D102A Inlet Isol, 2P52-F002A/2P52-F011A. • Notifies the SRO that the Prefilter has been swapped from "A" to "B". • 700-225 alarm clears.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 4

Event Description: RFPT loop seal failure.

Time	Position	Applicant's Actions or Behavior
10 Min		*SIMULATOR OPERATOR: At the direction of the Chief Examiner, ACTIVATE (**RB-6**)* • *mf65031541 "RFP Loop Seal Level Low (Annunciator On)"* • *mfN61_73 "Main Condenser Air In-leakage"* ***NOTE:** It takes approximately 28 minutes for vacuum to decrease to 25.9".*
	ATC	• Recognize RFP LOOP SEAL LEVEL LOW, (650-319), annunciator
	ATC	• Respond to annunciator RFP LOOP SEAL LEVEL LOW, (650-319) • Dispatches an SO to 2H21-P216 to confirm 2N22-F398, RFP Bracket Drain Loop Seal Fill Valve is open. • Monitors vacuum at 2H11-P650, on 2N21-R602. • Dispatches an SO to confirm seal water lineup and pressures IAW 34S0-N21-007-2, Condensate and Feedwater System.
	BOP	• Monitors Inlet Flow to Stack on 2N62-P600 • Receives INLET FLOW TO STACK HIGH, (600-020) • Monitors Inlet flow to Stack at 2N62-P600, on 2N21-R604
	SRO	May direct entry into 34AB-N61-002-2, Main Condenser Vacuum Low, abnormal.
	BOP	If directed, may REDUCE reactor power per 34GO-OPS-005-2, Power Changes, to establish and maintain vacuum greater than 25 in. Hg.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 4 Page 11 of 36

Event Description: RFPT loop seal failure.

Time	Position	Applicant's Actions or Behavior
		*SIMULATOR OPERATOR: Wait 4 minutes from being dispatched, NOTIFY the ATC of **ONE** of the following **messages**:* ***MESSAGE 1*** *IF 2N22-F265 is still OPEN REPORT:* • *Having difficulty locating 2N22-F398, RFP Bracket Drain Loop Seal Fill Valve but still attempting to locate.* • *Seal water pressures are normal and/but the lineup check is NOT completed.* • *NO water is coming out of weep holes.*
		MESSAGE 2 *IF 2N22-F265 has been CLOSED REPORT:* • *2N22-F398, RFP Bracket Drain Loop Seal Fill Valve was closed and now is open* • *Seal water pressures are normal and/but the lineup check is NOT completed.* • *NO water is coming out of weep holes.*
		*SIMULATOR OPERATOR: **ENSURE** Event Trigger **ET-N21-2** deletes **mfN61_73** when one of the following occurs:* • *Condenser vacuum drops to 25.9"* • *2N21-F265 is closed* *Then 45 seconds later, DELETES **mf65031541.***
	ATC	• With seal water pressures normal, will be required to close 2N21-F265, RFP Loop Seal Outlet Isol Vlv after 5 minutes of alarm RFP LOOP SEAL LEVEL LOW, (650-319), being received. • With vacuum degrading may close 2N21-F265 sooner to reverse degrading vacuum condition.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 4

Event Description: RFPT loop seal failure.

Time	Position	Applicant's Actions or Behavior
	ATC	• Opens 2N21-F265 when RFP LOOP SEAL LEVEL LOW, (650-319) clears.
	BOP	• Alarm INLET FLOW TO HOLDUP LINE HIGH, (600-020), clears when flow returns to normal.
		SIMULATOR OPERATOR; At Chief Examiners direction, proceed to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 5 Page 13 of 36

Event Description: Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. Suction valves for the first SBGT started will fail to open, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator, at the direction of the lead examiner, ENTERS: (**RB-5**) malfunction mfB21_229A final value of 0.05 and ramp of 1000.*
	ALL	• Receives Annunciators: • PRIMARY CNMT PRESSURE HIGH, (603-115) • MULTIPOINT TEMPERATURE RCDR 2T47-R626 TEMP HIGH, (657-025)
	SRO	• Directs the BOP to: • Enter 657-025 ARP. • Monitor Drywell pressure. • Vent the DW with SBGT, when DW pressure approaches 0.65 psig. • Enter 34AB-T23-002-2, Small Pipe Break Inside Primary Containment (may give this to the ATC since BOP will be at back panel). • Directs Operator Check DW Leakage per 34SV-SUV-019-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 5 Page 14 of 36

Event Description: Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. Suction valves for the first SBGT started will fail to open, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
		NOTE: Event triggers will insert overrides to keep the first valves that are operated from opening, that particular SBGT failing to auto start and then remove the event trigger from the opposite SBGT train. The examinee will NOT be successful with the first SBGT train; however, the second SBGT train used will be successful. ***Simulator Operator, ENSURE ET-T46-01 & ET-T46-02 are ACTIVATED.***
	BOP	• Enters 34SO-T48-002-2, "Containment Atmosphere Dilution System" or uses placard to vent the Drywell. • Enters 34SO-T46-001-2, "Standby Gas Treatment System" procedure or uses placard at the 2H11-P657 panel to start SBGT 2A or 2B. • Determines that 2T46-F001 (A or B) and 2T46-F003 (A or B) for the selected train will **NOT** open. • Informs SRO that SBGT (2A or 2B) **CANNOT** be started due to suction valve failure.
	SRO	• Addresses Tech Specs: • 3.6 Containment Systems • 3.6.4.3, Standby Gas Treatment System • Condition: 3.6.4.3.B, one required Unit 2 SGT subsystem inoperable. Required Action: 3.6.4.3.B.1, Restore required SGT subsystem to operable status. Completion time: 7 days AND 30 days from discovery of failure to meet the LCO. • Direct that maintenance be contacted to determine problem with failed SBGT suction dampers.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 5 Page 15 of 36

Event Description: Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. Suction valves for the first SBGT started will fail to open, must use opposite train to vent the Drywell.

Time	Position	Applicant's Actions or Behavior
	BOP	• Vents with the opposite train of SBGT per 34SO-T46-001-2 SBGT System procedure or uses placard.
	BOP (Placard)	• Opens 2T46-F001 (A or B) or 2T46-F003 (A or B) for the subsequent train. • Places SBGT Fan (2A or 2B) control switch to "RUN." • Receives (2B or 2A) SBGT SWITCH NOT IN AUTO, (657-091 or 654-076), alarm • Confirms 2T46-F002 (A or B) OPENS • Confirms SBGT Heater red light illuminates.
	BOP (Placard)	• Opens 2T48-F334A or 2T48-F334B (both valves may be opened) • Receives alarm DW VENT EXH BYPASS VLV OPEN, (657-008) or (654-002) • Receives alarm DRWL/TORUS N2 M/U 2 INCH ISOL VALVES OPEN, (657-042) or (654-035) • Opens 2T48-F335A or 2T48-F335B (both valves may be opened) • Opens 2T48-F336A or 2T48-F336B (both valves may be opened) • Monitors DW pressure • Notifies SRO that venting of the Drywell is in progress.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 6

Event Description: Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.

Time	Position	Applicant's Actions or Behavior
10 Mins		***Simulator Operator, at Chief Examiners direction,*** *ACTIVATE (**RB-4**)* *mfS11_227A, SUT 2C FAILURE.*
	All	The following annunciators is received: • 230KV BRKR TRIP, (653-218)
	BOP	• Acknowledges 230KV BRKR TRIP, (653-218) alarm • Communicates the alarm to the SRO
	BOP	Enters 230KV BRKR TRIP, (653-218) and performs the following: • On panel 1H11-P653, determine PCBs 179470 & 179480 breakers have tripped • Notifies substation maintenance so they may aid in determining and correcting the cause of alarm AND notify GCC of the cause and any actions taken. • Dispatches a SO to the Switch House to record any alarms and relay targets for the tripped breaker to aid in determining the cause of the trip. • Notifies the SRO to confirm the requirements of Unit 1 Technical Specifications, Section 3.8.1, are met AND perform any actions required by these Specifications.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 6

Event Description: Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: After one minute, *NOTIFIES Unit 2 Control Room that a Tornado was sighted near the High Voltage Switchyard and you saw a line fall in the High Voltage Switchyard. The Tornado has crossed over the river and is now moving into Toombs County and away from the plant.*

	SRO	• Directs the BOP to enter 34AB-Y22-002-0, Naturally Occurring Phenomenon, if NOT already entered.
		
		• Reviews TS 3.8.1 AC Sources – Operating, and enters 3.8.1 Condition A:
		
		  • TS 3.8.1 Condition A requires:
		
		  • A.1 - performance of SR 3.8.1.1 for OPERABLE required offsite circuits in 1 hour and once per 8 hours thereafter
		
		  • A.2 - declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable within 24 hours of discovery of no offsite power to one 4160 V ESF bus concurrent with inoperability of redundant required feature(s).
		
		  • A.3 - Restore required offsite circuit to OPERABLE status within 72 hours and 17 days from discovery of failure to meet LCO 3.8.1.a, b, or c.
		
		• Notifies SSS to perform (SR 3.8.1.1) 34SV-SUV-013-0 for inop SAT 2C.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 6 Page 18 of 36

Event Description: Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.

Time	Position	Applicant's Actions or Behavior
		NOTE: *The BOP can perform actions in 34AB-Y22-002-2 in any order and may not perform all actions before moving the scenario forward.*

	BOP	Enters 34AB-Y22-002-0, Naturally Occurring Phenomena and performs the following:
		• Notifies Security Personnel of the following:
		  • Merge the Plant PA AND the Simulator Building PA systems.
		  • Take appropriate security measures for Naturally Occurring Phenomena.
		  • Inform them of any actions which may degrade the current level of security, OR a need to close or open security doors, power outages which could impact security lighting OR communication equipment, etc.
		  • Have them consider securing outside post AND bring officers inside for protection.

		NOTE: *The BOP can perform actions in 34AB-Y22-002-2 in any order and may not perform all actions before moving the scenario forward.*
	BOP	• Makes a Page announcement. • The shift operating crew will review 34AB-R22-003-2, Station Blackout procedure. • Notify Maintenance AND Facilities to remove OR secure equipment in the Protected AND outside areas. • Notify the System Operator in Birmingham AND the Division Operator in Valdosta. • Inspect the plant, Independent Spent Fuel Storage Installation (ISFSI), AND Switchyard for damages. • May inform the Shift Manager to evaluate an Emergency Classification.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 6 Page 19 of 36

Event Description: Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.

Time	Position	Applicant's Actions or Behavior
		NOTE: The BOP can perform actions in 34AB-Y22-002-2 in any order and may not perform all actions before moving the scenario forward.

	BOP	• Confirms Unit 1 4160V Emergency Buses, on SAT 1D, per 34SO-R22-001-1, 4160 VAC Systems Operation, 1R22-S005, 1R22-S006 & 1R22-S007
		• Confirms Unit 2 4160V Emergency Buses, on SAT 2D, per 34SO-R22-001-2, 4160 VAC Systems Operation, 2R22-S005, 2R22-S006 & 2R22-S007
		• Dispatches operators to the Diesel Building to prepare to locally start any diesels that are needed AND fail to start automatically.
		• Notifies SRO to suspend the following:
		  • All surveillance testing
		  • All core alterations AND movement of irradiated fuel
		  • Maintenance on, AND restore to operable status the following systems:
		  • All ECCS
		  • RCIC
		  • RPS
		  • EDG
		  • Emergency Power Supply Buses
		  • PSW

		NOTE: The BOP can perform actions in 34AB-Y22-002-2 in any order and may not perform all actions before moving the scenario forward.
	BOP	• Notifies SRO that since a SCRAM did not occur, AND a tornado hit the plant site, reactor power is required to be reduced to 40-50% of RTP per 34GO-OPS-005-2, Power Changes
	SRO	• IAW 34AB-Y22-002-2, directs ATC to decrease reactor power to ~45% by decreasing Recirc flow. Power decreases should be made as recommended by the STA/Reactor Engineering at a rate not to exceed 10 MWe/min.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 6 Page 20 of 36

Event Description: Tornado causes loss of SAT 2C with ATC lowering reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.

Time	Position	Applicant's Actions or Behavior
		***NOTE**: May get the RBM UPSCALE, (603-202) and ROD OUT BLOCK, (603-238), alarm, if a peripheral control rod is not selected. This is expected and the operator may select a peripheral rod at this time.* *May also get HEATER TROUBLE, (650-135) alarm. This is expected at this power level.*
	ATC	• IAW 34SO-B31-001-2 (step 7.1.5) & 34GO-OPS-005-2, the ATC decreases Recirc pump speed, by either of the following ways: • Exceeding 10 MWE per minute by depressing the FAST LOWER pushbutton on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is between 40%-50%. • NOT exceeding 10 MWE per minute by depressing the LOWER SLOW or LOWER MEDIUM pushbuttons on the Master (P603 panel) or Individual controls (P602 panel) until reactor power is between 40%-50%. • If using Individual Controls, pump speed increases will alternate between the "A" & "B" Recirc pumps to prevent excessive flow mismatches. • Monitors power decrease by observing APRM and generator output indications. • Notifies SRO of attaining 45% reactor power.
		Simulator Operator, after ~ 5% power reduction or at the Chief Examiners direction, PROCEEDS to the MAJOR event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 7

Event Description: Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram. FW isolation F006A fails to close.

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator, at Chief Examiners direction, MODIFY malfunction mfB21_229A to Final value of **60** with ramp of **1000**. When the Mode switch is placed to shutdown, ENSURE Event Trigger C71-1 inserts Main Condenser Inleakage to 100% and mfG31_242 RWCU unisolable leak in the Drywell.*
	ALL	• Recognizes rapidly increasing Containment Pressure from the following alarms: • PRIMARY CNMT HIGH PRESSURE TRIP, (603-106) • PRIMARY CNMT PRESSURE HIGH, (603-115) • DRYWELL PRESSURE HIGH, (602-210)
	SRO	• Directs ATC to perform RC-1 placard • Directs BOP to perform RC-2 & RC-3 placards • Enters RC & PC EOP Flowchart • Enters CP-1 when a loss of all high pressure feed systems occurs
	ATC (Placard)	• Performs RC-1 consisting of: • Inserts a manual scram using the SCRAM pushbuttons • Places the mode switch to shutdown. • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display. • Informs the SRO that all rods are fully inserted. • Places SDV isolation valve switch to "isolate" & confirms closed. • If not tripped, places the Recirc pumps at minimum speed. • Inserts SRMs and IRMs. • Shifts recorders to read IRMS, when required. • Ranges IRMS to bring reading on scale. • Notifies SRO when RC-1 complete.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 7 Page 22 of 36

Event Description: Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram. FW isolation F006A fails to close.

Time	Position	Applicant's Actions or Behavior
		*NOTE: **IF** "A" FW Line break has **NOT** been discovered, the BOP will perform the following RC-2 actions; otherwise see **Event 8** for RWL actions.*

	BOP	• Performs RC-2 actions consisting of:
		• Confirms proper Level Control response:
		  • Checks ECCS Injection Systems and secure as necessary.
		  • If NOT running, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock
		  • Ensures FW Master Controller setpoint reduces to 9 inches and output reduces to 25% of previous value.
		• IF set down does not auto function, then manually reduces FW Master Controller setpoint to approximately 9 inches.
		• When feed flow is less than the capacity of the S/U level control valve (≈ 1.5 mlbm/hr), then:
		  • Opens 2N21-F125.
		  • Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.
		  • Closes 2N21-F110.
		• May attempt maximize CRD flow IAW 34SO-C11-005-2
		• May attempt to restart the CRD pumps (***neither pump will restart***)
		• Attempts to controls RWL with the RCIC System (**see Event 9**).
		• Notifies SRO if RWL gets outside assigned band.

	BOP	• Performs RC-3 consisting of:
		  • Monitor RPV pressure.
		  • Confirm proper operation of pressure control system (TBV, LLS, etc.).
		  • If necessary, allow RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS. (LLS 2B will NOT cycle on LLS setpoints)
		  • Maintain RPV pressure between 1074 and 800 psig.
		  • Notify SRO of pressure control system operation.

	SRO	• Per the PC flowchart, verifies torus level is <285 inches and may direct ATC to spray the Torus if RHR is NOT needed for adequate core cooling.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 7 Page 23 of 36

Event Description: Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram. FW isolation F006A fails to close.

Time	Position	Applicant's Actions or Behavior
	ATC	• Re-opens 2P41-F316s due to high temp on the Condensate Pumps/Booster pumps per 34AB-P41-001-2, Loss of PSW, Placard OR as directed by the SRO. • Places the "A" and "B" Isolation Override switches on the 2H11-P652 panel to Override • Fully opens 2P41-F316A or C and 2P41-F316B or D • Throttles 2P41-F316C or A and 2P41-F316D or B to open while monitoring PSW division 1 and 2 pressure on 2H11-P650 panel ensuring that PSW pressure remains above 80 psig.
	ATC	• Sprays the Torus per 34SO-E11-010-2 placard on the 2H11-P601 Panel as follows: • Places Cnmt Spray Vlv Cntl switch in the MANUAL position. • Starts RHR pump(s) in loop A (B), if NOT already running. • Opens 2E11-F028A or B • Opens 2E11-F027A or B • Throttles Open 2E11-F027A or B • Notifies SRO that RHR is in Torus Sprays (The flow is only 700gpm, so it may be difficult to see flow indication from a distance.)
	SRO	• Per the PC flowchart, may direct ATC to spray the Drywell if RHR is NOT needed for adequate core cooling. • Confirms Torus pressure > 11 psig, verifies that Torus Level is <215 inches, in the safe area of Graph 8 (DWSIL) and then directs an operator to: • Place the DW cooling fans to Off • Shutdown Recirc pumps (if running) • Spray the DW

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 7 Page 24 of 36

Event Description: Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram. FW isolation F006A fails to close.

Time	Position	Applicant's Actions or Behavior

	ATC	• If directed to spray the Drywell, places BOTH Recirc pumps to PTL Off on panel 2H11-P602.
		• Places the following DW cooling fans control switches in the OFF position.
		  • 2H11-P654:
		  • 2T47-B007B
		  • 2T47-B008B
		  • 2T47-B009B
		  • 2T47-B010B
		  • 2T47-C001B
		  • 2T47-C002B

	ATC	• 2H11-P657:
		  • 2T47-B007A
		  • 2T47-B008A
		  • 2T47-B009A
		  • 2T47-B010A
		  • 2T47-C001A
		  • 2T47-C002A

	ATC	• Sprays the Drywell using 34SO-E11-010-2 placard at P601 panel.
		  • Places Cnmt Spray (A or B) Vlv Cntl switch in the MANUAL position.
		  • Starts RHR pump(s) in loop A (B), if not already running.
		  • Opens 2E11-F021A or B
		  • Opens 2E11-F016A or B and establishes flow > 5000 gpm on 2E11-R608A or B.
		  • When directed, closes 2E11-F016A or B
		  • Closes 2E11-F021A or B
		  • Notifies SRO that DW spraying the Drywell is complete

	SRO	• Directs H_2/O_2 Analyzers placed in service IAW 34SO-P33-001-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 7

Event Description: Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram. FW isolation F006A fails to close.

Time	Position	Applicant's Actions or Behavior
	ATC	• Places H_2/O_2 Analyzers in service IAW 34SO-P33-001-2 • Confirms closed 2P33 F605, Panel Inlet from Torus • Places 2P33 S16, LOCA Override, H_2/O_2 Analyzer Outbd Isol Vlvs to Bypass • Places 2P33 S17, LOCA Override, H_2/O_2 Analyzer Inbd Isol Vlvs to Bypass • Confirms the H_2/O_2 Analyzer Running red light for the A & B train are illuminated • If either train red light does not illuminate, depresses Channel A or Channel B Reset pushbuttons on 2H11-P700 panel. • Confirms analyzers are running. • Notifies SRO H_2/O_2 Analyzers are running.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 8 Page 26 of 36

Event Description: 2N21-F006A fails to close requiring all Cond/FW isolated

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, the malfunction for this event was in at the beginning of the scenario (diN21-F006A Final Value of OPEN).
	BOP	• Discovers "A" FW line break • Notifies SRO of "A" FW line break and attempts to close 2N21-F006A, "A" FW Isolation valve on P603 panel • Notifies SRO that 2N21-F006A will NOT close • Closes 2N21-F110, S/U Level Control Bypass Vlv (Critical Task) • Closes 2N21-F125, S/U Level Control Isol Vlv (Critical Task) ***NOTE:*** *The above Critical Task, if NOT performed, will require an Emergency Depress from exceeding EOP Graph 2, Heat Capacity Temperature Limit.*

	BOP	• Once 2N21-F110 & 2N21-F125 are closed performs either:
		  • Trips RFPTs or lowers RFPT speed to minimum
		  • Places all Condensate Booster pumps switches in Pull-To-Lock OFF
		  • Shuts down all Condensate pumps except ONE.

	SRO	• Directs the BOP to:
		  • Close 2N21-F006A
		  • Close 2N21-F110
		  • Close 2N21-F125

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 8 Page 27 of 36

Event Description: 2N21-F006A fails to close requiring all Cond/FW isolated

Time	Position	Applicant's Actions or Behavior

	BOP	**IF** HPCI pumping out of the "A" FW Line break has **NOT** been discovered:
		• Adjusts 2E41-R612, HPCI Flow Control, to desired injection rate
		• Transfers 2E41-R612 controller to manual and adjust its speed demand output to obtain the desired pump flow
		
		IF HPCI pumping out of the "A" FW Line break **HAS** been discovered:
		• Shuts down HPCI by:
		  • Depresses and holds the HPCI Turbine Trip pushbutton
		  • When HPCI turbine has stopped, places 2E41-C002-3, HPCI Aux Oil Pump, in Pull-To-Lock
		  • When HPCI TURBINE BRG OIL PRESS LOW, (601-112), alarm is received, releases the HPCI Turbine Trip push-button.

	BOP	• May attempt to restart the CRD pumps (***neither pump will restart***) • Attempts to controls RWL with the RCIC System (**see Event 9**). • Notifies SRO if RWL gets outside assigned band.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 9

Event Description: RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches.

Time	Position	Applicant's Actions or Behavior
		*The malfunction for this event was in at the beginning of the scenario (mfE51_61, RCIC Overspeed). Event Trigger **ET-E51-9** will trip RCIC when speed is ~ 3000 rpm.*

	BOP	• Attempts to manually start RCIC, if it has not auto started:
		  • Depresses RCIC Manual Initiation P/B
		  • Confirms 2E51-F046 opens
		  • Confirms Barom Cndsr Vac Pump started
		  • Confirms 2E51-F045 opens
		  • Confirms 2E51-F013 opens
		  • Observes rpm increasing and then RCIC tripping

		Simulator Operator, if dispatched to RCIC, wait 4 minutes and INFORM the BOP/SRO that the RCIC Overspeed trip will NOT be reset because the linkage is disconnected and laying on the floor. If requested, INFORM operator you will notify Maintenance.

	BOP	• Recognize that RCIC tripped and responds to annunciator RCIC TURBINE TRIP, (602-301).
		  • Confirms RCIC Turbine Tripped per the following indications:
		  • 2E51-F524, Trip & Throttle Valve, indicates closed.
		  • Turbine Speed decreasing
		  • 2E52-F013, Pump Discharge Valve, indicates closed.
		  • 2E51-F019, Min Flow Valve, indicates closed.
		  • Closes 2E51-F524, Trip & Throttle Valve actuator
		  • Recognizes that the 2E51-F524, Trip & Throttle Valve actuator will not run down and determines that RCIC has tripped on Overspeed.
		  • Dispatches SO to locally reset RCIC Overspeed condition.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 9 Page 29 of 36

Event Description: RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches.

Time	Position	Applicant's Actions or Behavior

	BOP	• Confirms all MSIVs close at -101 inches OR 10 inches Mercury Vacuum
		• Monitors RPV water level as it trends down.
		• Informs the SRO of water level reaching –155."
		• Manually arms LLS actuation logic by performing the following:
		  • Confirms RPV pressure > 1074 psig
		  • Opens any SRV by placing control switch to open
		  • Confirms red and yellow indicator light for SRV illuminated
		  • Returns LLS valve control switch to close or ADS valve to auto
		• Monitors RPV pressure to confirm proper operation of LLS.

	SRO	• Per CP-1
		  • Orders emergency depressurization after RWL level decreases to below –155 inches; but prior to RWL decreasing to below –185 inches
		  • Orders all available table 8 systems injecting until RWL increases to above –155 inches

	BOP	If directed, attempts to maximize injection from CRD. (will **NOT** work)
		NOTE: When RWL drops below -101 inches OR Main Condenser Vacuum decreases to 10 inches Mercury Vacuum, the MSIVs will close requiring the following actions to take place.
	SRO	• Per CP-1 • Order BOP to Inhibit ADS • Orders BOP to start ALL RHR & Core Spray pumps. • Orders Emergency Depressurization once water level decreases below –155" and prior to –185". • Orders all available Table 8 systems injecting until water level raises above –155". • Orders SBLC injection. • As time permits, directs Torus Cooling to be placed in service.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 9

Event Description: RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches.

Time	Position	Applicant's Actions or Behavior
	BOP	• Verifies ALL RHR & Core Spray pumps (P601) are running or starts by placing switches to start IAW placard.
	ATC/BOP	• Places SBLC switch to either Start A or Start B • CONFIRM the following: • 1106A and 1106B, Squib Vlv Ready, Indicating Lights, EXTINGUISHED • SBLC LOSS OF CONTINUITY TO SQUIB VALVE (603-152) annunciator ALARMED • Selected 2C41-C001A or 2C41-C001B, SBLC Pump, has STARTED • CONFIRM or CLOSE 2G31-F004, Rx Water Cleanup Vlv, panel 2H11-P601 • Notifies SRO SBLC is injecting

	ATC	• Opens 7 ADS valves prior to RWL reaching -185" by: (Critical Task)
		  • Placing switches for the ADS valves to OPEN.
		  • Confirms ALL ADS valve red lights illuminate.
		  • Confirms ALL ADS valve yellow lights illuminate.
		  • Confirms Reactor pressure is decreasing.
		  • Notifies the SRO that ALL ADS valves are open.

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 9

Event Description: RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches.

Time	Position	Applicant's Actions or Behavior
		NOTE: The operator may place Torus Cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A and/or B loop of RHR may be used depending on Torus temperature. The following steps are written assuming "B" loop and "B" pump is used. If/When "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.
	ATC	• Enters 34SO-E11-010-2, Residual Heat Removal • Places RHRSW in service • Prelube RHRSW pump • Overrides 2E11-F068B (A) Low Discharge Pressure Interlock • Positions 2E11-F068B (A) to 45% OPEN • Acknowledges RHR HX B (A) DIFF PRESS LOW, (601-215) / (601-313) • Starts RHRSW pump B (A) • Places 2E11-F068B (A) Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B (A) to obtain < 4400 gpm AND < 450 psig
	ATC	• IF desired to start a SECOND RHRSW pump, • Throttles 2E11-F068B (A) to achieve max flow rate (not to exceed 4400 GPM). • Opens 2E11-F068B (A) an additional 5%. • Starts second RHRSW Pump. • Positions 2E11-F068B (A) to obtain < 8800 gpm AND < 450 psig

Op-Test No.: 2013-301 **Scenario No.:** 8-04 **Event No.:** 9 Page 32 of 36

Event Description: RCIC trips on overspeed. Loss of High pressure feed. Emergency Depress between TAF & -185 inches.

Time	Position	Applicant's Actions or Behavior
	ATC	• Places RHR B (A) Loop in Torus Cooling per the placard by performing the following steps: • Opens 2E11-F048B (A) • Closes 2E11-F047B (A). • Opens 2E11-F003B (A). • Starts RHR Loop B (A) pump • Opens 2E11-F028B (A) • Receives annunciator AUTO BLOWDOWN CS OR RHR PRESS, (602-312) • Receives annunciator SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) • Throttles OPEN 2E11-F024B (A) • Opens 2E11-F047B (A) • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B • Notifies the SRO that RHR "B" (A) loop is in service • May place the second pump in service.
	SRO	• If SBLC was started previously, directs that SBLC be secured following the Emergency Depress before SBLC tank level decreases to below 8%.
	ATC/BOP	• Verifies / Opens RHR and Core Spray injection valves open once the Reactor Pressure Low 500 psig alarm illuminates. • Verifies injection from Core Spray and RHR pumps begins as soon as reactor pressure decreases below the shut off head of the pumps. • When water level is restored above Top of Active Fuel throttles flow for C/S and RHR per the SRO directions. • If directed by the SRO, places the SBLC switch (P603) to the off (mid) position.
		With Chief Examiners Permission: *The scenario should be terminated when the crew has Emergency depressurized the reactor before -185" AND re-established adequate core cooling with water level above TAF.*

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.:** 8-04 **Op-Test No.:** 2013-301

Initiating Conditions:	Unit 2 is operating at 53% RTP, increasing power to place the 2nd RFPT in service. SRV 2B inop for LLS. A Tornado watch has been issued by the National Weather Service for Southern Toombs and Northern Appling counties.
Turnover	Unisolate RCIC, place in standby and then increase reactor power to 65% RTP.

Summary:

- **Event 1**: Normal; Unisolate RCIC system and place in standby.
- **Event 2**: Component; SRV 2F (LLS) cycles open/close until fuses are pulled. **(Critical Task)**
- **Event 3**: Component; Instrument Air System Prefilter dP Hi – swap Prefilters. The operator will dispatch an SO locally to determine dP. Report back will require BOP swapping Prefilters to restore normal system flow/pressure. (OE)
- **Event 4:** Component; RFPT loop seal failure requiring manual operation of bypass valve to prevent Main Turbine trip on low vacuum.
- **Event 5:** Component/TS; Small Feedwater line leak causes DW pressure to increase. The team will receive a P603 alarm that will direct DW venting to be placed in service. The BOP operator will attempt to start Standby Gas Treatment (SBGT). The SBGT suction dampers will not open for the first SBGT system the operator attempts to start. The opposite SBGT train will then be started and DW venting will be aligned. The SRO will address TS for an inoperable train of SBGT.
- **Event 6**: Reactivity/TS; A Tornado causes the loss of SAT 2C requiring the ATC to lower reactor power to ~45% to comply with 34AB-Y22-002-0, Natural Occurring Phenomena.
- **Event 7:** Major; Leak on the "A" FW line in the DW worsens/ruptures resulting in the crew inputting a reactor scram.
- **Event 8:** Component; 2N21-F006A fails to close requiring the BOP to close 2N21-F125 and F110, isolating all Condensate/Feedwater. **(Critical Task)** This is critical since the Condensate/Feedwater system has the potential to pump ~189,000 gallons of Hotwell/CST water to the DW and then to the Torus via the broken FW line, requiring an Emergency Depress from exceeding EOP Graph 2, Heat Capacity Temperature Limit.
- **Event 9:** Component; RCIC trips on Overspeed causing RWL to decrease. When RWL reaches TAF, the SRO will direct the ATC operator to open all SRVs to Emergency Depressurize the RPV and restore RWL with low pressure ECCS pumps. The plant will be emergency depressed due to low RWL. **(Critical Task)**

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.:** 8-04 **Op-Test No.:** 2013-301

Critical Tasks

- SRV 2F (LLS) valve cycles open and close until the fuses are pulled. **(Event 2)**
- Close 2N21-F125 and F110, isolating all Condensate/Feedwater. **(Event 8)**
- Open ADS valves before RWL reaches -185 inches. **(Event 9)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	8	1. 2F LLS SRV cycles open/close until fuses are pulled **(Event 2)** 2. Instrument Air System Prefilter dP Hi – swap Prefilters **(Event 3)** 3. RFPT loop seal failure **(Event 4)** 4. Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. **(Event 5)** 5. Tornado causing loss of SAT 2C **(Event 6)** 6. Leak on the "A" FW line in the DW worsens/ruptures **(Event 7)** 7. 2N21-F006A fails to close requiring all Cond/FW isolated. **(Event 8)** 8. RCIC trips on overspeed. Loss of High pressure feed. **(Event 9)**
2.	Malfunctions After EOP Entry	1-2	2	1. 2N21-F006A fails to close requiring all Cond/FW isolated. **(Event 8)** 2. RCIC trips on overspeed. Loss of High pressure feed. **(Event 9)**
3.	Abnormal Events	2-4	3	1. 2F LLS SRV cycles open/close until fuses are pulled **(Event 2)** 2. Small leak on the "A" FW line in the DW requiring SBGT to vent Drywell. **(Event 5)** 3. Tornado causing loss of SAT 2C **(Event 6)**
4.	Major Transients	1-2	2	1. Leak on the "A" FW line in the DW worsens/ruptures **(Event 7)** 2. Emergency Depress between TAF & -185 inches. **(Event 9)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. RC (Non-ATWS) EOP Flowchart **(Event 7)** 2. PC EOP Flow Chart **(Event 7)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. CP EOP Flow Chart **(Event 9)**

Appendix D **Scenario Outline Continued** **Form ES-D-1**

DRAFT

Facility: E. I Hatch **Scenario No.:** 4-04 **Op-Test No.:** 2009-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

7.	Critical Tasks	2-3	3	1. SRV 2F (LLS) valve cycles open and close until the fuses are pulled. **(Event 2)** 2. 2N21-F006A fails to close requiring the BOP to close 2N21-F125 and F110, isolating all Condensate/Feedwater, requiring an Emergency Depress from exceeding EOP Graph 2, Heat Capacity Temperature Limit. **(Event 8)** 3. Emergency Depress with 7 ADS valves prior to RWL reaching -185 inches. **(Event 9)**

ILT-08 NRC Operating Exam Scenario 4
Turnover Sheet

Target ZERO — Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	A Tornado watch has been issued by the National Weather Service for Southern Toombs and Northern Appling counties for the next 2 hours. Unit 2 is operating at 53% RTP and holding due to current weather conditions. RCIC is being returned to a standby lineup. RFPT '2A' operating at 1000 rpm. Activities in progress: Unisolate RCIC.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Orange ☐ Yellow ☐ Red
Scheduled evolutions:	☐ Unisolate RCIC starting at step 7.1.1.36 of 34SO-E51-001-2. ☐ After weather improves, increase reactor power to 60% RTP and then place 2A RFPT in IAW 34SO-N21-007-2. ☐ After RFPT '2A' is in service, increase reactor power to 75% RTP IAW 34GO-OPS-005-2.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ RCIC (RAS written 2 days ago) ☐ SRV 2B inop for LLS Function (RAS written)
Active tagouts:	☐ None
Rod Configuration:	☐ See RWM

Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I. Hatch **Scenario No.:** 8-05 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at 90% power preparing to place Torus Cooling in service for an upcoming RCIC surveillance the next shift.

Turnover: Continue placing 'B' Loop of RHR in Torus Cooling at step 7.2.5.2.8 of 34SO-E11-010-2. After 'B' Loop of RHR is in Torus Cooling, increase reactor power to 95% RTP via Recirc.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Continue placing 'B' Loop of RHR in Torus Cooling at step 7.2.5.2.8 of 34SO-E11-010-2.
2	aoN40R600 mf65111604 mf651116045	C (BOP)	UAT 2B Hi temp/swap house loads/remove from service
3	mfE51_250 svoE51075	C (ATC) TS (SRO)	RCIC Steam Line breaks in the Rx bldg. RCIC isolation valves fail to auto close (Critical Task)
4	mf60121104 (ON)	C (BOP) TS (SRO)	RHRSW pump overload – manually trip & swap pumps.
5	mfB31_40A	C (ATC) TS (SRO) R (ATC)	Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. Reduce reactor power to achieve Minimum speed on Recirc Pump 2A then trip Recirc Pump 2A.
6	mfS11_161	M (ALL)	Loss of Offsite Power
7	mfR43_62A mfR43_239C mfR43_49B	C (ATC)	2A EDG will tie after manually started,1B EDG will NOT operate & 2C EDG fails to auto tie (Critical Task to energize at least one emergency bus)
8	mfE41_106	C (BOP)	HPCI flow controller output fails low requiring manual increase to obtain injection (Critical Task)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 1 Page 2 of 32

Event Description: Continue placing Torus Cooling in service.

Time	Position	Applicant's Actions or Behavior
10 Mins	SRO	Orders BOP to continue placing Torus Cooling in service beginning at step 7.2.5.2.8
		Simulator Operator, if asked, an SO has been dispatched locally awaiting the start of the RHR pump AND, if asked, a Page Announcement has been performed for the upcoming pump start.
	BOP	• Starts RHR Pump B or D • Dispatches an operator to locally check the RHR pump for seal leakage • May dispatch an operator to locally check that the charging motor stops running and the charged tab is visible.
		Simulator Operator – as an SO in the RHR B pump diagonal; Inform the BOP that there is NO seal leakage on RHR pump "B".
	BOP	The following expected alarms will be received as a result of starting the RHR pump.
		• SEC SYSTEM AUTO INITIATIONSIGN, (650-234) • AUTO BLOWDOWN CS OR RHR PRESS PERMISSIVE, (602-312) • RHR FLOW LOW, (601-222)
		• Opens 2E11-F028B • Throttles Open 2E11-F024B to establish ≤ 7700 GPM flow on indicator 2E11-R603B or 2E11-R608B recorder.
		• Opens 2E11-F047B, Hx Inlet Vlv • Closes 2E11-F048B, Hx Bypass Valve • Confirms 2E11-R600B-1 indicates >20 psid, if NOT throttles 2E11-F068B to maintain > 20 PSID • Informs the SRO that RHR B pump is in Torus cooling
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 2 Page 3 of 32

Event Description: UAT 2B Hi temp requiring the removal from service.

Time	Position	Applicant's Actions or Behavior
15 Min		*Simulator Operator At Lead Examiner's direction, ACTIVATE: (**RB-2**)* • *mf65111604, Unit Aux Xfmr "2B" Misc Alarm (Annunciator On)* • *aoN40R600, Gen & Transformer Temps, final of 110, ramp 100* *THEN, 2 minutes later ACTIVATE: (**RB-9**)* • *mf65111605, Unit Aux Xfmr "2B" Winding Temp High (Annunciator On)*
	ALL	UNIT AUX XMFR 2B MISC ALARM, (651-116), annunciates Two minutes later, UNIT AUX XMFR 2B WINDING TEMP HIGH, (651-117) annunciates.
	BOP	• Responds to alarm UNIT AUX XMFR 2B MISC ALAR, (651-116) • Notifies GCC of the alarm. • Dispatches an operator to check the transformer local panel in the Low Voltage Switchyard, 2H21-P214. • Responds to alarm UNIT AUX XMFR 2B WINDING TEMP HIGH, (651-117) • Notifies the SRO that per the ARPs Rx Power will need to be reduced if the winding temperature is increasing and to Transfer the loads to Startup Transformer (SUT) 2C, if the oil temperature is high.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 2 Page 4 of 32

Event Description: UAT 2B Hi temp requiring the removal from service.

Time	Position	Applicant's Actions or Behavior
		SIMULATOR OPERATOR: • *3 minutes from being dispatched, call the control room as the operator dispatched to the Unit 2B UAT and report that the 2B UAT oil temperature is 91°C and that the winding temperature is 106°C and slowly increasing. If asked Transformer fans and oil pumps are running.* • *DO NOT PROMPT TO TRANSFER LOADS* • *If more updates of temperature are required, increase temps 1°C EACH UPDATE, until load is reduced.* • *Temps will eventually stabilize above the setpoints* *When the UAT is unloaded, temps will slowly decrease, however the afore mentioned alarms will NOT clear until locally reset.*
	SRO	• Directs BOP operator to enter 34SO-R22-001-2 for transferring 4160VAC buses from Unit Aux Transformer (UAT) 2B to Start-Up transformer (SUT) 2C
	BOP	• Enters 34SO-R22-001-2 • Reviews the precautions and limitations section and starts at step 7.3.6 of the procedure.
	BOP	Swapping of 2A 4160VAC from the UAT to the SUT • Verifies reactor power < 2558 MWth • Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651 • Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652)
	BOP	• Places 135434/135454 Station Svc Interlock Cutout switch in OFF-(DOWN) • Places Sync Switch (SSW) ACB 135454 in ON • Confirms the sources of power to 4160V Bus 2A are synchronized and voltage is normal on Start-Up Aux Transformer 2C

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 2

Event Description: UAT 2B Hi temp requiring the removal from service.

Time	Position	Applicant's Actions or Behavior
	BOP	• Closes ACB 135454, 4160V Bus 2A Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C • Trips ACB 135434, 4160V Bus 2A Normal Supply • Places Sync Switch (SSW) ACB 135454 in OFF • Places 135434/135454 Station Svc Interlock Cutout switch in NORMAL-(UP)
	BOP	Swapping of 2B 4160VAC from the UAT to the SUT • Verifies reactor power < 2558 MWth • Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651 • Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652)
		• Places 135444/135464 Station Svc Interlock Cutout switch in OFF-(DOWN) • Places Sync Switch (SSW) ACB 135464 in ON • Confirms the sources of power to 4160V Bus 2B are synchronized and voltage is normal on Start-Up Aux Transformer 2C
	BOP	• Closes ACB 135464, 4160V Bus 2B Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C • Trips ACB 135444, 4160V Bus 2B Normal Supply • Places Sync Switch (SSW) ACB 135464 in OFF • Places 135444/135464 Station Svc Interlock Cutout switch in NORMAL-(UP) • Notifies the SRO that 4160 VAC 2A and 2B buses have been transferred from the UAT to SUT 2C.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 2

Event Description: UAT 2B Hi temp requiring the removal from service.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, after UAT 2B is removed from service, MODIFIES Override aoN40-R600 to a Final of 50 with a 5 ramp rate.
		SIMULATOR OPERATOR, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 3

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
15 Min.		*Simulator Operator: ENTER **RB-5** to starts the following RCIC steam leak:* • *mfE51_250 (RCIC Leak) 100/3* • *svoE51075 (F008 stuck open)* • *svoD11174 D11-K609A Rx Bldg Pot Contam Area Vnt 10 ramp 6* • *svoD11175 D11-K609B Rx Bldg Pot Contam Area Vnt 10 ramp 6* • *svoD11176 D11-K609C Rx Bldg Pot Contam Area Vnt 10 ramp 6* • *svoD11177 D11-K609D Rx Bldg Pot Contam Area Vnt 10 ramp 6* ***NOTE:*** *It takes approximately 1.5 minutes for the 601-321, "Leak Det Diff Temp High" to alarm.* *When, LEAK DET DIF TEMP HIGH, (601-321) alarms ENSURE Event Trigger (**ET-E51-2**) ACTIVATES.* • *mf60141026 Rx Bldg Pot Contam Area Radiation High (Annunciator On) approximately 60 seconds later.*
		• Monitors Steam Tunnel temps • Enters 34AB-T22-001-2, 'Primary Coolant System Pipe Break – Rx Building.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 3 Page 8 of 32

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges LEAK DET DIF TEMP HIGH, (601-321) and reports to SRO. Enters 601-321 and starts investigating.

		• Confirms which area is producing alarm using Temperature Recorder on 2H11-P614:
		  • R604, Pt. 115 is reading approximately 32°F delta-T
		  • R608, Pt. 117 is reading approximately 32°F delta-T
		• Enters 34AB-T22-003-2, 'Secondary Containment Control'

		*SIMULATOR OPERATOR: ENSURE Event Trigger (**E51-2**) is ACTIVATED when alarm, LEAK DET DIFF TEMP HIGH, (601-321) illuminates.* ***NOTE:*** *It will take about 30 minutes for a Group 1 isolation to occur. At direction of the Chief Examiner, if P603-2 "Group 1 System A Trip" alarms, IMMEDIATELY DELETE mfE51_250.*
	SRO	• Enters the 31EO-EOP-014-2, 'Secondary Containment' EOP Flowchart on Secondary Containment High Differential Temperature. • Has an operator monitor Sec Cont. Temps. • Has operators monitor systems for source of the leak.
	BOP	Receives RX BLDG POT CONTAM AREA RADIATION HIGH, (601-426) and reports to SRO, then enters 601-426 and starts investigating.
		• On panel 2H11-P600, confirms radiation levels on 2D11-K609A - D on 2D11-R605 recorder • On panel 2H11-P606, monitors radiation levels on 2D11-K609 A - D, R/B Pot Contamination Vent Exh Rad Mon A through D. • Enters 34AB-T22-003-2, Secondary Containment Control.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 3

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior

		SIMULATOR OPERATOR:
		*If 2E51-F007 is **CLOSED** DO NOT ENTER (**RB-10**):*
		
		*SIMULATOR OPERATOR: When EOP SC flowchart is ENTERED and Chief Examiner concurs ENTER (**RB-10**) mfE51_113 (RCIC Auto Isolation E51-F008)*
		• *ENSURE Event Trigger (**E51-1**) is ACTIVATED when F007 is manually closed:*
		  • *svoD11174*
		  • *svoD11175*
		  • *svoD11176*
		  • *svoD11177*
		  • *mf601411026*

		As time allows the BOP will enter the following ARPs:
	BOP	Responds to the following annunciators: • RCIC STEAM LINE DIFF PRESS HIGH, (602-302) • RCIC TURBINE TRIP, (602-301) • RCIC ISOLATIOM SIGNAL LOGIC A, (602-307) • RCIC ISOLATIOM SIGNAL LOGIC B, (602-313) Time:_____
	BOP	Responds to failure of RCIC Isolation: • Places 2E51- F008 control switch to CLOSE. • Places 2E51- F007 control switch to CLOSE *(Critical Task is to position 2E51-F007 control switch to close within 5 minutes of receiving 602-302, 602-307 and 602-313 listed above OR may close before alarms are received).* Time:_____ • Informs SRO of failure of 2E51-F008 to close • Dispatches operator/Maintenance to investigate the leak.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 3

Event Description: RCIC steam line break with failure to auto close, manual works.

Time	Position	Applicant's Actions or Behavior
	SRO	Reviews Tech Specs section 3.6.1.3, 'Primary Containment Isolation Valves' Condition A.1 and A.2 and determines: • 2E51-F008 Inop • 2E51-F007 must be closed and deactivated within 4 hours AND • 2E51-F007/F008 penetration must be verified ISOLATED every 31 days. • As time allows, contacts the Shift Support Supervisor to draft a Danger Tagout for 2E51-F007. Enters TS RAS for RCIC 3.5.3 Condition A, which requires verifying HPCI is operable within 1 hour and restoring RCIC in 14 days.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 4

Event Description: RHRSW pump overload – manually trip & swap pumps.

Time	Position	Applicant's Actions or Behavior
15 Min		*At the Chief Examiner's direction, Simulator Operator;* *ENTERS (**RB-4**) malfunction mf60121104 – Window 32 RHRSW PUMP B OVERLOAD (ANNUNCIATOR ON).* *ENSURE **ET E11-10** deletes malfunction mf60121104, when RHRSW pump 2B switch is placed to stop.*
	All	• Annunciator RHR SERV WTR PUMP B OVERLOAD, (601-232) alarms
	BOP	• Announces alarm to the SRO • Enters ARP 34AR-601-232-2 • Determines that the 2B RHRSW pump is still running • Informs the SRO that the 2B RHRSW pump failed to trip
	SRO	• Directs the BOP to Trip the 2B RHRSW pump and place the 2D RHRSW pump is service
	BOP	• Trips RHRSW Pump 2B And Verifies Green light illuminates • Alarm RHR HX B DIFF PRESS LOW, (601-215) is received when the RHRSW pump is secured. • Confirms 2E11-F068B, Hx B Disch Vlv, closes. • Alarm 601-215 clears when the 2E11-F068B is closed.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 4 Page 12 of 32

Event Description: RHRSW pump overload – manually trip & swap pumps.

Time	Position	Applicant's Actions or Behavior
		NOTE: If the crew decides to secure Torus Cooling instead of starting 2D RHRSW pump, skip the following steps for placing 2D RHRSW pump in service and go to the steps just prior the SRO making the Tech Spec call for inop RHRSW pump.
	BOP	• Enters 34SO-E11-010-2, RHR System, OR may use Placard, to start 2D RHRSW Pump • Determines That The System Does NOT Require Filling • Depresses the RHR Service Water Lube Valves Pushbutton For Pump Division 2 And waits for One Minute

	BOP	• Bypasses The Low RHR Service Water Pressure Interlock On 2E11-F068B By Placing The Interlock Override Vlv 2E11-F068B Keylock Switch In The OVERRIDE Position.
		• Throttles Open 2E11-F068B To 45% Open As Indicated On 2E11-R600B.
		  • Confirms:
		  • 2E11-F068B Opens (RED light illuminates)
		  • 601-215, RHR HX B DIFF PRESS LOW, annunciator illuminates
		• May make a Page Announcement of pending RHRSW pump 2D start (Announcing large motor/pump starts may NOT occur if the operator senses the urgency to start the pump with low dP on the RHR/RHRSW system)
		• Starts the 2D RHRSW Pump and has the ATC log the start
		• Places 2E11-F068B Interlock Override Vlv keylock switch in the NORMAL position
		• Throttles 2E11-F068B to 4400 GPM maximum, while maintaining RHRSW System pressure < 450 PSIG
		• Confirms 2E11-R600B-1 indicates >20 psid, if NOT throttles 2E11-F068B to maintain > 20 PSID
		• Notifies Maintenance (if SRO has NOT) to investigate RHRSW pump 2B.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 4 Page 13 of 32

Event Description: RHRSW pump overload – manually trip & swap pumps.

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: When dispatched to check RHRSW B loop strainer dP, inform the BOP that the dP is 3 psid.
	BOP	• Dispatches SO to confirm that the in-service RHR Service Water strainer dP is < 8 PSID, and logs Dp in the Control Room Log • Informs the SRO that RHR B pump is in Torus cooling
		NOTE: *Start here if the crew decides to secure Torus Cooling instead of starting 2D RHRSW pump.*

	BOP	IAW 34SO-E11-010-2, performs the following starting with step 7.3.3.2.2.1:
		• OPENS 2E11-F048B, Hx Bypass Vlv
		• Closes 2E11-F024B, Full Flow Test Line Vlv
		• Confirms the following:
		  • 2E11-F007B, Min Flow Vlv, OPENS
		  • RHR FLOW LOW, (601-302), ALARMS
		• Stops the operating RHR Loop B Pump
		• Closes 2E11-F028B, Torus Spray OR Test Vlv
		• Confirms 2E11-S18B, Cnmt Spray Vlv Cntl 2/3 Core Ht Permis switch, in the OFF position
		• Confirms RESET the Containment Spray Vlv Control switch AND observe the green reset flag on the control switch
		• Confirms RHR Service Water System pump is off (previously manually shutdown)
		• Notifies SRO RHR Torus Cooling is shutdown.

		NOTE: *TS 3.0.6 provides information so that LCO 3.6.2.3 for RHR Suppression Pool Cooling is NOT required to be entered.*
	SRO	• Enters Tech Specs LCO 3.7.1 and determines that a 30 day RAS is required IAW TS 3.7.1.A. • Notifies Maintenance (if BOP has not) to investigate RHRSW pump 2B.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
18 Min		*SIMULATOR OPERATOR* *At Chief Examiner's direction, press (**RB-3**) to activate:* • *mfB31_40A, Recirc Pump A Motor High Temp* • *mf60211162, PUMP A MOTOR WINDING COOLING WATER FLOW LOW, (602-118)*
	All	• Receives PUMP A MOTOR WINDING COOLING WATER FLOW LOW, (602-118)
	ATC	• Enters PUMP A MOTOR WINDING COOLING WATER FLOW LOW, (602-118)

		• At panel 2H11-P650, confirm the RBCCW System is in operation and supplying water to the containment as indicated by 2P42-R603, RBCCW Flow To Drwl indicator.
		• At panel 2H11-P614, confirm winding temperatures are < 240°F, on 2B31-R601, Recirc Pump Temp Recorder
		  • Pt. 5, 175°F & increasing
		  • Pt. 6, 175°F & increasing
		  • Pt. 7, 175°F & increasing
		
		• At panel 2H11-P602 or 2H11-P603, REDUCES 'A' AND 'B' Recirc pump speed as necessary to maintain the 'A' winding temperatures below 240°F, per Section 7.1.6 of 34SO-B31-001-2 and IAW 34GO-OPS-005-2.
		• IF the winding temperatures CANNOT be maintained < 240°F, performs abnormal SHUT DOWN of Recirc Pump A per Section 7.2.1.3 of 34SO-B31-001-2,, Reactor Recirculation System
		• Notifies the SRO that the winding temperatures are > 240°F and increasing.
		• Notifies the SRO that the ARP requires reducing Recirc flow to maintain winding temperature < 240°F.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the operator to reduce Rx power with Recirc per 34GO-OPS-005 and 34SO-B31-001-2, section 7.1.6 "Two Loop Operation From Rated To Minimum Speed", exceeding 10 MWE/minute if necessary. • Reminds the operator that entry into the immediate exit region of the Power to Flow map is allowed. • Notifies Plant Management, Load Dispatcher, and Engineering that the power increase has been halted pending investigation of Recirc Pump 2A high winding temperature condition.

	ATC	• Enters the following procedures
		  • 34GO-OPS-005-2, "Power Changes"
		  • 34SO-B31-001-2, "Recirculation System"
		  • IAW 34SO-B31-001-2, the ATC decreases Recirc pump speed by depressing the Slow, Medium or Fast LOWER pushbuttons on the Master or Individual controls.
		  • Monitors power decrease by observing APRM and generator output indications.
		  • Stops power reduction periodically and monitors winding temperatures at panel 2H11-P614 on 2B31-R601, Recirc Pump Temp Recorder
		  • The alarm will NOT clear until the pump is tripped.
		  • Continues to decrease BOTH Recirc pump speeds until minimum/may secure pump before minimum due to winding temps
		  • Notifies SRO when BOTH Recirc Pumps are at minimum.
		  • Notifies the SRO that the winding temperatures DID NOT decrease after reducing BOTH Recirc pumps.
		  • Notifies SRO of entering Region of Potential Instabilities/Immediate Exit Region of Power to Flow Map.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5 Page 16 of 32

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
	BOP	Notifies chemistry of 15% power change in 1 hour IAW 34GO-OPS-005-2, "Power Changes", Step 5.2.13.
		NOTE: *If the crew decides to shut down the Recirc Pump early, the Region of Instabilities/Immediate Exit Region may not be entered, and the following steps will be skipped.*
		EXAMINER NOTE: *Log time when Region of Instabilities/Immediate Exit Region has been entered.* **Time:** _____
		NOTE: *Heater Trouble Alarm (650-135) may alarm due to plant conditions.* *NOTE: 15% power change sample required IAW limitation 5.2.13, 34GO-OPS-005-2.*
	SRO	• Directs the ATC operator to shutdown the A ASD IAW 34SO-B31-001-2 section 7.2.1.3, "Abnormal Recirc Pump/ASD A Shutdown". • As time allows, directs the BOP operator to secure one Condensate and one Condensate Booster Pump plus one RFPT.
	ATC	• Places ASD A control switch 2B31-S002A to Pull to Lock **OR** Depresses the ASD A Shutdown pushbutton and places ASD A control switch to Pull to Lock on panel 2H11-P602. • Enters 34AB-B31-001-2, "Reactor Recirculation Pump(s) Trip, Recirc Loops Flow Mismatch, Or ASD Cell Bypass" for single Recirc pump trip.
	Time	• Closes 2B31-F031A, Pump Disch Valve.
	Time	• Within 5 minutes, throttles 2B31-F031A, Pump Disch Valve, OPEN
	ATC	• Acknowledges the following annunciators: • ASD A TRIP WARNING, (602-101 • ASD A FATAL FAULT, (601-102) • ASD A TROUBLE, (601-108) • RECIRC LOOP A OUT OF SERVICE, (601-127)

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5 Page 17 of 32

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
		NOTE: *IAW 34AB-B31-001-2* *During single loop operation, WHEN the speed of the running pump decreases below approximately 35% speed, positive flow through the idle pump loop due to natural circulation overcomes the negative flow due to reverse flow. The total core flow summing circuitry will continue to subtract this positive idle loop flow from the running loop flow AND give a misleading LOW core flow indication. Total core flow can be calculated by adding the JET PUMP LOOP "A" AND the JET PUMP LOOP "B" flows.*
	SRO	• Has the operator determine if the plant is in the analyzed region of the Power to Flow map.
	ATC	• Determines that the plant is in the Immediate Exit Region of the Power to Flow map. • Acknowledges APRM UPSCALE, (603-219) and ROD OUT BLOCK, (603-238) annunciators.
	SRO	Performs the following:
	TIME	• **Within 15 minutes** of entering the Immediate Exit Region of the Power to Flow map, directs operator to exit the region by inserting control rods. (*Time is stopped when CR movement brief is started*)
	TIME	• Ensures the plant has **exited** the Immediate Exit Region of the Power to Flow map **within one hour**. (*Time is stopped when region is exited*)
		• Has a control rod movement brief per 34GO-OPS-065-0 • Directs ATC operator to insert rods to exit the Power to Flow Map "Immediate Exit Region".

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5 Page 18 of 32

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
		NOTE: *Advise the STA to recommend inserting the current rod group to its insert limit.*
	SRO	• Directs the operator to insert the rods to the insert limit after consulting with the STA. • References Tech Spec 3.4.1.A.1 and has 24 hours to meet requirements for Single Loop Operation.
		Simulator Operator *If the Team calls for the STA or Reactor Engineering, for rod movement recommendations:* • *Respond as follows:* • *"Use the Reactivity Manipulations Turnover."* ***NOTE:*** *RBM Downscale alarm may alarm during this movement due to the significant rod worth of these rods. It is allowed to flag the RBM Downscale and Rod Block alarm.*
	ATC	• Inserts control rods per 34GO-OPS-065-0, starting with control rod Group 53. • During rod insertion, rod steps will be performed in reverse sequential order, starting at the highest numbered step. (** rod steps are NOT required to be performed sequentially, but must be positioned to their RWM insert limit prior to inserting lower numbered groups). • Selects Rod • Places Control Rod movement switch to the IN position • Verifies Rod moves using Rod display information and Rx and Generator power decreasing.
	ATC	• If required, adjust 2C11-F003 to get 220 – 280 psid drive water dp.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
	ATC	• Releases Rod movement switch so that the control rod stops 1 position before the insert limit unless the insert limit is 00. • Initials Rod movement Sheet. • Verifier, if available, Initials Rod movement sheet. • Notifies the SRO when they are out of the region of potential instabilities.

	BOP	As soon as practical, removes condensate pumps (CP & CBP) from service prior to CBP discharge pressure < 525 psig OR power <70%.
		• For removal of CBP
		  • If 2C is to be removed, removes the Hydrogen Injection System from service
		  • Sends SO to closed selected pumps discharge valve
		  • Prior to discharge valve being full closed, trips pump and places control switch in Auto or PTL
		  • Has SO complete the procedure
		• Removal of CP
		  • Sends SO to closed selected pumps discharge valve
		  • Trips pump and places control switch in Auto or PTL
		  • If pump left in Standby, has SO reopen discharge valve

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 5

Event Description: Recirc Pump '2A' Winding cooling water flow low requiring reducing reactor power in an attempt to reduce temperatures. The pump will be reduced to minimum, and then tripped.

Time	Position	Applicant's Actions or Behavior
		NOTE: *IAW 34GO-OPS-005-2, "WHEN Feedwater flow is less than 7 mlbm/HR AND two Reactor Feed Pumps are running, one Reactor Feed Pump MAY be shutdown*
	BOP	As soon as practical, enters 34SO-N21-007-2, "Condensate And Feedwater System", section 7.2.1"First Reactor Feed Pump Shutdown and Leaving in Standby".
		• Confirms Feedwater Flow is less than 7 Mlbm / hr. • Confirms RFPT 2A AND RFPT 2B are in Automatic control on 2C32-R600, Master Controller. • Places 2C32-R601A (2C32-R601B), RFP A (B) M/A Station, in Manual, by depressing the 'M' pushbutton until it illuminates, panel 2H11-P603. • Slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until the other RFP is controlling reactor vessel level. ***NOTE:*** *At this point the operator may stop here with the RFPT NOT injecting and continue with this section as time allows.*
		• When the other RFP has control of water level, slowly decrease RFPT 2A (2B) speed with RFP A (B) M/A Station until NO speed decrease is observed AND/OR place the RFPT A (B) TMR switch to SS AND confirm Speed Setter yellow light illuminates. • Slowly lower RFPT 2A (2B) Speed Setter switch until RFPT speed is at 1000 rpm, at 2H11-P650. • IF desired, reduce the RFPT 2A (2B) speed to minimum AND allow the RFPT to "windmill", provided seal water, steam seals, AND lube oil systems remain in service.
		SIMULATOR OPERATOR, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 6

Event Description: Loss Of Offsite Power

Time	Position	Applicant's Actions or Behavior
15 Min		*SIMULATOR OPERATOR, at the direction of the Chief Examiner, ACTIVATE (**RB-6**), mfS11_161, "Loss of Offsite Power".*
	ALL	Recognize a Loss Of Offsite Power and plant scram.
		NOTE: *The SRO may assign one operator to perform Scram procedure placards RC-1, RC-2 and RC-3.*
	SRO	• Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • If time allows assigns TC-1 to be performed. • Enters the RC EOP flow chart, 31EO-EOP-010-2, once reactor water level decreases to 3,"or reactor pressure increases to 1074 psig. • Directs EOP RC level control band of +3" to +50"

	ATC	• Performs RC-1 consisting of:
		  • Inserts a manual scram.
		  • Places the mode switch to shutdown.
		  • Confirms all rods are inserted by observing full in lights, SPDS, or the RWM display.
		  • Notifies the SRO of rod position check.
		  • Places SDV isolation valve switch to "isolate" & confirms closed.
		  • Inserts SRMs and IRMs.
		  • Shifts recorders to read IRMS, when required.
		  • Ranges IRMS to bring reading on scale.
		  • Notifies the SRO when the above actions are complete.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 6 Page 22 of 32

Event Description: Loss Of Offsite Power

Time	Position	Applicant's Actions or Behavior
		NOTE: *With a Loss of Offsite Power, the pertinent operator RC-2 actions are limited to checking ECCS.*
	BOP	• Checks ECCS Injection Systems and verifies no initiation signal present.

		• Performs RC-3 consisting of:
		  • Monitor RPV pressure.
		  • Confirm proper operation of pressure control system (LLS and SRVs).
		  • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.
		  • Maintain RPV pressure between 1074 and 800 psig.
		  • Notify SRO that LLS is the pressure control system.

		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7 Page 23 of 32

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior

20 mins	ATC	• Confirms appropriate Diesel Generator response to the event and evaluates the emergency buses determining
		  • 2A EDG did NOT start, 2E bus is de-energized,
		  • 1B EDG did NOT start, 2F bus is de-energized,
		  • 2C EDG is running but did NOT energize 2G bus.
		
		• Enters 34AB-R22-003-2, "Station Blackout" and "Diesel Generator Recovery," abnormal, 34AB-R43-001-2.

		NOTE: *The ATC may start first with any of the Diesel Generators.*

	ATC	• IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2A:
		  • Determines the EDG is NOT running
		  • Determines the Auto Start System Operative Light is lit.
		  • Places the EDG START/STOP Switch to START
		  • Determines the 2A EDG has started
		  • Reports to SRO that 2E Bus is now energized. (*Critical Task to energize at least one emergency bus*)

	ATC	Reviews EDG "1B" annunciators and determines a "Lube Oil Press Low" and "Emergency Engine Shutdown".

		• IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG "1B":
		• Determines the EDG is NOT running
		  • Determines the Auto Start System Operative Light is NOT lit.
		  • Depresses the Shutdown Relay Pushbutton
		  • Alarm EMERGENCY ENGINE SHUTDOWN, (652-229) clears
		  • 100 seconds later 652-229 is received again
		  • Determines the EDG did NOT start.
		  • Sends an SO to locally start the EDG
		  • Sends an SO/Maintenance to investigate EDG failure

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior

	ATC	• IAW 34AB-R43-001-2, Diesel Generator Recovery, for EDG 2C:
		  • Determines the EDG is running
		  • Confirms the normal and alternate supply breakers are open.
		  • Using Diesel Generator 2C Speed Adjust switch lowers frequency to 57 Hertz, and then raises to 60 Hertz.
		  • Reports to SRO that 2G Bus is now energized. (*Critical Task to energize at least one emergency bus*)

		SIMULATOR OPERATOR: When called as the SO to investigate the EDGs, wait two minutes and report: • *EDG "1B" has a break on the oil pump discharge line*
		NOTE: *The following can be performed in any order.*

	ATC/BOP	• As time allows, directs the SSS to perform the following:
		  • 2A RPS MG Set - restarted
		  • RPS Alternate Supply from 2B Essential Cabinet - restarted
		  • 2A SSAC local breaker - reclosed
		  • Vital AC Alternate supply returned to service
		  • Depresses Non-Essential Load lockout on Panel 2H11-P652
		  • Restore Division I Station Service Battery Chargers by depressing pushbuttons on 2H11-P664 (may have been previously performed)
		  • Restores RBCCW as follows:
		  • Directs SO to close discharge valve 2P42-F005A, or F005C
		  • Places RBCCW pump control switch to off and then to auto
		  • Directs SO to slowly open discharge valve 2P42-F005A, or F005C
		  • Starts second pump by taking control switch to off and then to run

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior
		NOTE: The following can be performed in any order.

	ATC/BOP	• As time allows, directs the SSS to perform the following:
		  • 2B RPS MG Set - restarted
		  • RPS Alternate Supply from 2B Essential Cabinet - restarted
		  • 2B SSAC local breaker - reclosed
		  • Vital AC Battery Charger returned to service
		  • Depresses Non-Essential Load lockout on Panel 2H11-P652
		  • Restore Division II Station Service Battery Chargers by depressing pushbuttons on 2H11-P664 (may have been previously performed)
		  • Restores RBCCW as follows:
		  • Directs SO to close discharge valve 2P42-F005B
		  • Places RBCCW pump control switch to off and then to auto
		  • Directs SO to slowly open discharge valve 2P42-F005B
		  • Starts second pump by taking control switch to off and then to run

	SRO	• Enters the PC EOP flow chart. • May direct operator to restart Drywell Chillers and Cooling Fans IAW EOP-100.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7 Page 26 of 32

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior
	ATC	• If directed, restores drywell chillers per 31EO-EOP-100-2 section 3.7 by: • Verifies chilled water expansion tank is within normal level, (NO high/low alarms on 2H11-P700 panel or verify locally) • Verifies D/W temperature is <250°F, in the vicinity of 2T47-B007A / 2T47-B007B • Notifies SSS to place switch for 2P64-C008A/2P64-C008B, Chilled Water pump, to RUN & then verify Chilled Water return temperature is <100°F. • Place 2P64-S3, LOCA Override Switch, to BYPASS on panel 2H11-P700. • Notifies SSS to: • Open link, Lower TB4-12 in 2R22-S005 Fr. 6, for 2P64-B006A • Open link, Upper TB1-11 in 2R22-S007 Fr. 7, for 2P64-B006B • Reset 86 lockout relays on drywell chiller breaker on 4160V buses "E" and "G" (2R22-S005 Fr. 11 and 2R22-S007 Fr. 11 • Reset the POR relay for each chiller. • Monitors for chiller start by observing the red light on 2H11-P700 or input from the SSS.
	ATC	• If directed, restores the drywell coolers per 31EO-EOP-100-2 section 3.6 by: • Verifies chilled water expansion tank is within normal level, (NO high/low alarms on 2H11-P700 panel or verify locally) • Verifies D/W temperature is <250°F, in the vicinity of 2T47-B007A / 2T47-B007B • Notifies SSS to place switch for 2P64-C008A/2P64-C008B, Chilled Water pump, to RUN & then verify Chilled Water return temperature is <100°F. • Places drywell cooling fans system A key-lock LOCA override switch to BYPASS on 2H11-P657. • Places drywell cooling fans system B key-lock LOCA override switch to BYPASS on 2H11-P654. • Observes the drywell cooler fans start by observing their red lights illuminating on 2H11-P654 and panel P657.
	SRO	• May direct operator to place Torus Cooling in service if Torus temperature exceeds 95°F.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7 Page 27 of 32

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior
	BOP (Placard)	• Enters 34SO-E11-010-2, Residual Heat Removal or uses placard on 2H11-P601. • Places RHRSW in service • Prelubes RHRSW B pump • Overrides 2E11-F068B Low Discharge Pressure Interlock • Positions 2E11-F068B to 45% OPEN RHR HX B DIFF PRESS LOW, (601-215) alarms
	BOP (Placard)	• Starts RHRSW pump B • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 GPM AND < 450 PSIG • RHR HX B DIFF PRESS LOW, (601-222) alarm clears
	BOP (Placard)	• Place RHR loop B in Suppression Pool Cooling • Does NOT position the 2/3 Core Height Permissive switch. (RWL will NOT be lowered to below 2/3 core height) • Does NOT place the Containment Spray valve Control switch in the manual position. (LOCA signal is NOT present) • Confirm open 2E11-F048B, HX Bypass Vlv. • Close 2E11-F047B, Hx Inlet Vlv. • Confirm open 2E11-F003A, HX Outlet Vlv • Start "2B RHR pump • SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) alarms • AUTO BLOW DOWN CS OR RHR PRESS PERMISSIVE, (602-312) • RHR FLOW LOW,(601-222) alarms

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 7

Event Description: EDG 2A will tie after manual start and EDG 2C auto starts but fails to tie/must lower then raise frequency to energize bus. 1B EDG will not run

Time	Position	Applicant's Actions or Behavior
		• Open 2E11-F028B, Torus Spray or Test Vlv. • Throttle open 2E11-F024B, Full Flow Test Line Vlv. and establish RHR flow of less than or equal to 7700 gpm (R603B) - RHR Flow Low (601-215) alarm clears • Open 2E11-F047B, Hx Inlet Vlv. • Close 2E11-F048B, Hx Bypass Vlv. • Reports to SRO that RHR has been placed in Suppression Pool Cooling mode.
		Simulator Operator, the next event was already active during the Major Event.

Op-Test No.: 2013-301 **Scenario No.:** 8-05 **Event No.:** 8 Page 29 of 32

Event Description: HPCI flow controller output fails low requiring manual increase to obtain injection.

Time	Position	Applicant's Actions or Behavior
		*Simulator Operator, ENSURE Event Trigger **E41-1** ACTIVATES malfunction mfE41_106, HPCI Flow Controller Fails Low, with HPCI speed >3800 rpm.*
	BOP	• Allows HPCI to auto start at –35" or 1.85 psig DW pressure OR manually starts per 34SO-E41-001-2, prior to Emergency Depressurization on low RWL. • Opens 2E41-F059, Lube Oil Cooling Wtr Vlv. • Starts 2E41-C002-2, Barometric Condenser Vacuum Pump. • Opens 2E41-F001, Turbine Steam Supply Vlv. • Starts 2E41-C002-3, Aux Oil Pump. • Opens 2E41-F006, Pump Discharge Valve.
		***NOTE TO EXAMINER:** Prolonged operation with HPCI <2000 RPMs is to be avoided.*

	BOP	• Confirms the following valves OPENED:
		  • Turbine Control Vlv
		  • Turbine Stop Vlv
		• Confirms the turbine does NOT come up to proper speed.
		• Recognizes that HPCI flow controller has failed and places 2E41-R612, Flow Controller, in MANUAL and adjusts output to maintain RWL. (Critical Task)
		• When flow increases to 790 GPM, confirms 2E41-F012, Min Flow Vlv, closed.

		Termination criteria: *The scenario may be terminated, at the direction of the Chief Examiner, when RWL is being controlled with HPCI and at least ONE Emergency bus has been energized.*

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.:** 8-05 **Op-Test No.:** 2013-301

Initiating Conditions:	Unit 2 is operating at 90% power preparing to place Torus Cooling in service for an upcoming RCIC surveillance the next shift.
Turnover	Continue placing 'B' Loop of RHR in Torus Cooling at step 7.2.5.2.8 of 34SO-E11-010-2. After 'B' Loop of RHR is in Torus Cooling, increase reactor power to 95% RTP via Recirc.

Summary:

- **Event 1**: Normal; 2A RHR Loop will be placed into service.
- **Event 2**: Component; UAT 2B will experience a Hi temperature requiring the removal from service
- **Event 3**: Component/TS; A RCIC steam line will break outside of Primary Containment. The outboard isolation valve is failed open and cannot be closed. Both isolation valves fail to automatically close on an automatic isolation signal and must be manually closed. **(Critical Task)** The SRO addresses Tech Specs for inoperable Primary Containment Isolation Valve.
- **Event 4:** Component/TS; RHRSW pump overload requiring manually tripping & starting another RHRSW pump in the B Loop of RHR.
- **Event 5:** Component/TS/ Reactivity; Recirc Pump '2A' will experience a low winding cooling water flow requiring reducing reactor power in an attempt to control temperatures. The pump will be reduced to minimum speed and then tripped. The SRO addresses TS for an inoperable Recirc pump. The plant will be operating below the Immediate Exit Region of the Power-to-Flow map.
- **Event 6**: Major; The plant will experience a Loss of Offsite power with all 4160 V Emergency Buses initially de-energized
- **Event 7:** Component; 2C EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2C EDG output breaker to close. 2A EDG will tie after manually started. **(Critical Task to energize at least one emergency bus)**
- **Event 8:** Component; HPCI flow controller output fails low requiring the BOP to manually increase speed to obtain HPCI injection. **(Critical Task)**

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.:** 8-05 **Op-Test No.:** 2013-301

Critical Tasks

- Manually isolate the RCIC isolation valves within 5 minutes of receiving 602-302 and 602-313. **(Event 3)**
- 2C EDG fails to auto tie to the emergency bus and must have its frequency lowered, then raised to force the 2C EDG output breaker to close. 2A EDG will tie after manually started. **(Event 7)**
- HPCI flow controller fails low requiring the BOP to manually increase speed to obtain HPCI injection to maintain RWL above TAF. **(Event 8)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	7	1. UAT 2B Hi temp **(Event 2)** 2. Recirc Pump '2A' Winding cooling water flow low **(Event 5)** 3. RHRSW pump overload **(Event 4)** 4. RCIC steam line break **(Event 3)** 5. Loss Of Offsite Power **(Event 6)** 6. Manually start EDG 2A, manually tie EDG 2C **(Event 7)** 7. HPCI flow controller fails. RCIC trips on overspeed during startup **(Event 8)**
2.	Malfunctions After EOP Entry	1-2	2	1. Manually start EDG 2A, manually tie EDG 2C **(Event 7)** 2. HPCI flow controller fails. RCIC trips on overspeed during startup **(Event 8)**
3.	Abnormal Events	2-4	4	1. Recirc Pump '2A' Winding cooling water flow low **(Event 5)** 2. RCIC steam line break **(Event 3)** 3. Loss Of Offsite Power **(Event 6)** 4. Manually start EDG 2A, manually tie EDG 2C **(Event 7)**
4.	Major Transients	1-2	1	1. Loss Of Offsite Power **(Event 6)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. SC/RR EOP Chart **(Event 5)** 2. RC EOP flow chart **(Event 6)**
6.	EOPs contingencies requiring substantive actions	0-2	1	1. 31EO-EOP-100-2 **(Event 7)**
7.	Critical Tasks	2-3	3	1. Manually isolate RCIC **(Event 3)** 2. Manually start EDG 2A, manually tie EDG 2C **(Event 7)** 3. Manually increase speed to obtain HPCI injection. **(Event 8)**

ILT-8 NRC Operating Exam Scenario 5

SHIFT TURNOVER

target ZERO Every day, every job, safety.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at 90% power preparing to place Torus Cooling in service for an upcoming RCIC surveillance the next shift. Activities in progress: Continue placing 'B' Loop of RHR in Torus Cooling at step 7.2.5.2.8 of 34SO-E11-010-2. After 'B' Loop of RHR is in Torus Cooling, increase reactor power to 95% via Recirc.
Protected Train: ☒ Division I ☐ Division II	**EOOS:** ☒ Green ☐ Yellow ☐ Orange ☐ Red
Scheduled evolutions:	☐ Continue placing 'B' Loop of RHR in Torus Cooling at step 7.2.5.2.8 of 34SO-E11-010-2. ☐ Increase Reactor power to 95%
Surveillances due this shift:	☐ None
Inop Equipment:	☐ None
Active tagouts:	☐ None
Rod Configuration:	See RWM

Appendix D **Scenario Outline** **Form ES-D-1**

NRC DRAFT

Facility: E. I Hatch **Scenario No.:** 8-06 **Op-Test No.:** 2013-301

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions. Unit 2 is operating at approximately 7% RTP preparing to swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2.

Turnover: Continue startup IAW 34GO-OPS-001-2, Plant Startup, starting at step 7.3.22 to increase pressure set to 920 psig. Once complete pull rods to increase reactor power to 9% RTP in preparation of transferring the mode switch to Run.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP)	Swap operating Steam Packing Exhausters.
2	N/A	R (ATC)	Raise pressure set from 915 to 920 psig and then pull control rods to continue Startup to ~ 7% power.
3	mfC12_26 30-03 mfC51_9A	C (ATC) TS (SRO)	IRM "A" fails upscale and Control Rod 30-03 scrams in.
4	mfN33_154	C (BOP)	Turbine Gland Seal Reg Fails Closed (must be in chest warming)
5	svoB21220	C (ATC)	SRV 2B21-F013G opens. The SRV will close after the ATC cycles the SRV C.S. IAW AB section. (Critical Task) The SRO will initiate a tracking RAS.
6	mfG31_207B svoG31070 mfG31_52	C(BOP) TS (SRO)	RWCU line breaks outside of Primary Containment. Must be manually isolated (Critical Task), with failure of outboard isolation valve to close.
7	mfB21_247A mfB21_247B mfC11_211	M (ALL)	Inadvertent Group 1 Isolation, MSIV closure Scram Discharge Volume ATWS (Critical task)
8	mfC41_240A mfC41_240B	C (ATC)	SBLC Pump '2A' start failure SBLC Pump '2B' start failure Inject SBLC locally
9	diE51_S33 mfE51_109 mfE41_235A mfE41_235B	C (BOP)	RCIC Manual Initiation PB fails RCIC/HPCI fails to Auto start on low level/hi DW pressure. Manual actions required for injection.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 1

Event Description: Swap Steam Packing Exhausters

Time	Position	Applicant's Actions or Behavior
3 min	BOP	• Places 2N33-C001 Stm Pkg Exh Blower 2A Control Switch to the OFF position. • Opens 2N33-F025B, SPE Blower Disch Vlv, UNTIL Red OPEN indicating light ILLUMINATES. • Places 2N33-C001 Stm Pkg Exh Blower 2B the Control Switch to the RUN.
		• Throttles OPEN 2N33-F025B, SPE Blower Disch. Vlv, UNTIL Steam Packing Exhauster Vacuum indicates between 10-20 inches of water vacuum as read on 2N33-R601B. • Closes 2N33-F025A, SPE Blower Disch Vlv. • Places the control switches in STOP for 2N33-F025A & B.
		Simulator Operator, at the Chief Examiners direction, as Shift Manager, direct the SRO to proceed to raising pressure set to 920 psig.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 2 Page 3 of 33

Event Description: Raise pressure set to 920 psig, pull control rods to ~ 9% power and transfer the reactor mode switch to run

Time	Position	Applicant's Actions or Behavior
7 Min		***NOTE:*** *IAW 34GO-OPS-001-2, Attachment 15, the maximum increase above 500 psig is < 1.6 psig/min due to SRV leakage considerations.*
	SRO	Directs the ATC to increase EHC pressure set to 920 psig.
	ATC	Enters 34GO-OPS-001-2, 'Plant Startup', at step 7.3.22 and at the DEHC panel computer, performs the following steps:
		Selects the **Control** → **psi- load** screen
		Intermittently uses (Clicks) the **Raise** button to increase reactor pressure to 920 psig. (This will take approx. 4 minutes.) **OR** Sets Pressure Set to 920 psig with a ramp rate less than 1.6 psig/min.
		Notifies the SRO that EHC pressure set is at 920 psig.
	SRO	Directs ATC to continue rod withdrawal to approximately 9% power
		NOTE: *Alarm, APRM DOWNSCALE, (603-228), may cycle in and out due to APRMs being at their downscale setpoint of 5 %.*
	ATC	• Starting at Step 25 rod 38-31, withdraws control rods within a step to their withdraw limit • May receive alarm, APRM DOWNSCALE, (603-228), until APRMs are >5% RTP • Initials for control rod withdrawal • Dates for control rod withdrawal • May start withdrawing rods in Step 26 as necessary to achieve 9% RTP • Notifies SRO that reactor power is approximately 9% RTP

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 2 Page 4 of 33

Event Description: Raise pressure set to 920 psig, pull control rods to ~ 9% power and transfer the reactor mode switch to run

Time	Position	Applicant's Actions or Behavior
	SRO	Directs: • ATC confirm all APRMs indicate between 7% AND 10%. • BOP confirm operable APRM DOWNSCALE trips are clear
	ATC	Reports all APRMs indicate between 7% AND 10%.
	BOP	Confirms operable APRM DOWNSCALE trips are clear by performing the following at the APRM ODAs at 2H11-P608: • Depress the "ETC" key • UNTIL "TRIP STATUS" option ILLUMINATES. • Depress "TRIP STATUS" key, • THEN confirm "APRM FLUX DOWNSCALE ALARM" is NOT active.
	SRO	Directs BOP or ATC to confirm all IRMs are NOT Upscale.
	BOP/ATC	Confirms NO IRMs are UPSCALE by observing: • 2H11-P606 upscale lights NOT illuminated **OR** • 2H11-P603 upscale lights NOT illuminated **OR** • 2H11-P603 annunciator 603-221, "IRM Upscale" NOT illuminated
	SRO	Directs the ATC (or observes) the following annunciators are CLEAR: • MAIN STEAM LINE PRESS A LOW, (603-232) • MAIN STEAM LINE PRESS B LOW, (603-233)
	ATC	If directed, reports annunciators 603-232 and 603-233 are clear.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior
8 Min		*Simulator operator, as directed by the Chief Examiner, activate **RB-3** (IRM A Upscale and rod 30-03 scram)*
	ALL	• Address receiving the following alarms: • REACTOR NEUTRON MONITOR SYS TRIP, (603-109) • REACTOR AUTO SCRAM SYSTEM A TRIP, (603-117) • IRM BUS A UPSCALE TRIP OR INOP, (603-203) • IRM UPSCALE, (603-221) • ROD OUT BLOCK, (603-238) • ROD DRIFT, (603-247) • CRD ACCUMULATOR PRESS LOW OR LEVEL HIGH, (603-148) • Identifies control rod 30-03 has scrammed full in.
		NOTE: *The team may immediately address the abnormal procedure 34AB-C11-004-2, Mispositioned Control Rods, since the control rod is mispositioned.*
	ATC	• Addresses annunciator REACTOR NEUTRON MONITOR SYS TRIP, (603-109). • Confirms validity of the alarm by checking the neutron monitoring indicators on panel 2H11-P603, 2H11-P606, and 2H11-P608. • Identifies IRM A has failed upscale and observes the HIGH/INOP red LED is illuminated. • Reports the information to the SRO.
	ATC	• Addresses annunciator REACTOR AUTO SCRAM SYSTEM A TRIP, (603-117) • Confirm scram group A 1 2 3 4 lights for Trip System A on panel 2H11-P603 are extinguished. • Determine the cause of the trip is IRM "A". • Requests OD-7 Option 2 is run to determine whether control rod movement has occurred. • Bypasses IRM "A"

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3 Page 6 of 33

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior
	ATC	• Addresses annunciator IRM BUS A UPSCALE TRIP OR INOP, (603-203)
		• Confirms • One OR more of A, C, E or G IRM Upscale Trip OR Inop lights are illuminated on Panel 2H11-P603. • Channel A Scram Group lights are Extinguished • REACTOR NEUTRON MONITORING SYS TRIP, (603-109) is Alarmed • REACTOR AUTO SCRAM SYSTEM A TRIP, (603-117) is Alarmed • White Rod Out light is Extinguished • ROD OUT BLOCK ,(603-238) is Alarmed • Mode Switch is in the OPERATE position • Notifies the Shift Supervisor the IRM is failed, and IF possible, Bypasses the IRM on 2H11-P603.
		Simulator Operator, when the operator resets the scram, ENSURES ***ET-C71-2****, DELETES mfC12_26_30-03; this will cause the blue scram light for the rod to extinguish.*
	ATC	• Acknowledges the following annunciators clear: • REACTOR NEUTRON MONITORING SYS TRIP, (603-109) • IRM BUS A UPSCALE TRIP OR INOP, (603-203) • IRM UPSCALE, (603-221) • ROD OUT BLOCK, (603-238) • Resets RPS Channel A using 2C71-S5, Reactor Scram Reset Switch • Acknowledge annunciator REACTOR AUTO SCRAM SYSTEMA TRIP, (603-126) clears.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior
	ATC	• Addresses annunciator IRM UPSCALE, (603-221)
		• Confirms: • One or more of the IRM Upscale Alarm lights are illuminated, 2H11-P603. • IRM indicates greater than 80/125 of full scale. • White Rod Out light is extinguished. • ROD OUT BLOCK, (603-238) Is Alarmed • Notifies the Shift Supervisor the IRM is failed, and IF possible, Bypasses the IRM.
	ATC	• Addresses annunciator ROD OUT BLOCK, (603-238)
		• Confirms: • White Rod Out light is extinguished, 2H11-P603 • Cause of the rod block • Attempt to correct or bypass • If alarm is due to a change in Recirc flow and is concurrent with the "RBM DOWNSCALE" annunciator, with SRO permission, selects a different central control rod. (NO)
	ATC	• Addresses annunciator ROD DRIFT, (603-247) • At panel 2H11-P603, confirms that one or more Rod Drift lights are illuminated on the full core display. • Selects the scrammed rod and confirms that RPIS indicates the rod is NOT at an even reed switch position. • Acknowledges annunciator RMCS/RWM ROD BLOCK OR SYSTEM TROUBLE, (603-239) received. • Notifies the Shift Supervisor and the STA • Refers to 34AB-C11-004-2, "Mis-positioned Control Rods," for recovery of drifting OR mispositioned control rod. • When directed by the Shift Supervisor, resets the rod drift using the Rod Drift Alarm reset switch on Panel 2H11-P603

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior
	ATC	• Addresses annunciator "Rod Out Block, 34AR-603-148-2
		• Determines which accumulators are involved, 2H11-P603 • Dispatches System Operator to 2H21-P003/P012, CRD Accumulator Monitor Panels, to confirm the red light(s) is illuminated
	SRO	• Notifies I&C/maintenance to troubleshoot failure of IRM "A". • Notifies maintenance to investigate the cause of the control rod scramming in, possible blown fuse. • Directs ATC to bypass IRM "A" and reset the ½ scram. • Addresses Tech Specs section 3.1.6.A, "Rod Pattern Control," and determines has 8 hours to: • Declare the rod inoperable OR • Move the rod to the correct position.
	SRO	• Addresses Tech Specs section 3.3.1.1, "RPS Instrumentation" and determines that with the failure of IRM 'A' that sufficient IRMs are still operable at this time. • Addresses TRM T3.3.2, "Control Rod Block Instrumentation", and determines that with the failure of IRM 'A' that sufficient IRMs are still functional at this time.
	SRO	• Directs STA confirm compliance Power Distribution Limits per with TS 3.2.
	ATC	• Acknowledges CRD ACCUMULATOR PRESS OW OR LEVEL HIGH, (603-148) clears. • If NOT already performed, RESETS the rod drift. • Acknowledges ROD DRIFT, (603-247) clears

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior

	ATC	• Enters 34AB-C11-004-2, "Mis-positioned Control Rods."
		• Refers to Subsequent Action Table
		  • 4 OR less C/Rs mispositioned greater than 1 notch (YES) OR
		  • 1 OR more C/Rs NOT in compliance with BPWS (YES) THEN
		  • Enter section 4.7
		• Refers to Attachment 1 for the proper actions to take.
		  • Are >4 rods mispositioned? NO
		  • Is the reactor sub-critical? NO
		  • Is reactor power < LPSP (21%)? YES
		  • Refer to T.S. 3.1.6
		  • Perform Action 1
		  • Refer to T.S. 3.2
		  • Refer to Attachment 2 for restoration steps.

		Simulator Operator: *As the team gets to the point of needing Attachment 2, provide the team with the attached marked up copy of Attachment 2 of 34AB-C11-004-2 (2 pages).* *When contacted as reactor engineering with the following question from 34AB-C11-004-2, "Contact Reactor Engineering to determine what thermal limits were experienced during the event AND what recovery actions are necessary." Answer NO thermal limits have been exceeded and the recovery method will be to continuously withdraw the rod.* *If called, as Shift Manager, give permission to bypass RWM and withdraw control rod 30-03.*
	ATC	• Refers to Attachment 2 to recover the control rod. • Bypasses RWM IAW 34GO-OPS-065-0 • Withdraws the control rod 30-03 using both the rod Movement switch and the Rod Out Notch Override switch. • Performs coupling check • Acknowledges annunciator "RMCS/RWM ROD BLOCK OR SYSTEM TROUBLE, (603-239) clears. • Unbypasses RWM

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 3

Event Description: IRM 'A' Upscale and Control rod 30-03 Scrams in

Time	Position	Applicant's Actions or Behavior
	SRO	• Addresses Tech Specs section 3.3.2.1, "Control Rod Block Instrumentation" Required Action C due to RWM bypassed:
		C.1 Suspend control rod movement except by scram. OR
		C.2.1.1 Verify ≥ 12 rods withdrawn. OR C.2.1.2 Verify by administrative methods that startup with RWM inoperable has NOT been performed in the last calendar year. AND C.2.2 Verify movement of control rods is in compliance with banked position withdrawal sequence (BPWS) by a second licensed operator or other qualified member of the technical staff.
	SRO	• As time allows, declares RWM operable when unbypassed.
		Using time compression, As maintenance report that control rod 30-03 had a fuse blown, which has been replaced. *Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.*

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 4 Page 11 of 33

Event Description: Main Turbine Gland Seal Regulator valve fails closed

Time	Position	Applicant's Actions or Behavior
5 Min		*Simulator Operator: At the direction of the Chief Examiner, ENTER malfunction mfN33_154 (**RB-4**).* ***NOTE:** If the F004 valve is NOT opened, it takes approximately 2.5 minutes for the turbine to trip on low vacuum.* ***NOTE:** Event Trigger **N33-1** will cycle this malfunction for approximately 3 minutes and then leave the malfunction inserted.*
	ALL	Receives STEAM SEAL PRESS LOW, (650-125) annunciator followed shortly with PRETREATMENT O/G RADIATION DOWNSCALE/INOP, (601-428).
	BOP	Responds to STEAM SEAL PRESS LOW, (650-125) annunciator • Confirms 2N33-R601A, Steam Seal Hdr Pressure Indicator, is below 1.5 psig, panel 2H11-P650. • Confirms OPEN 2N33-F003, Steam Seal Main Steam Feed Vlv. • Confirms CLOSED 2N33-F005, Unloading Bypass Vlv. • Confirms CLOSED 2N33-F008, Aux Steam Feed Vlv. • Throttle OPEN 2N33-F004, Steam Seal Feed Vlv Bypass, to bring steam seal pressure to between 2.5 PSIG and 4.5 PSIG.
		Simulator Operator: when operator has entered the 650-125-2, DELETE scenario N33-1 and modify mf N33_154 to a delay of 0.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 4 Page 12 of 33

Event Description: Main Turbine Gland Seal Regulator valve fails closed

Time	Position	Applicant's Actions or Behavior

		• Sends an SO to the Steam Seal Feed Valve Controller to confirm > 20 # Air Inlet Pressure AND < 15 # Air Outlet Pressure.
		• Acknowledges annunciators received:
		  • PRETREATMENT O/G RADIATION DOWNSCALE/INOP, (601-428)
		  • INLET FLOW TO STACK HIGH, (N62-020) with recorder 2N62-R604 indicating flow increasing.
		  • May isolate the following valves on 2N62-P600 if O/G pressure increases to > 6 psig on 2N62-R600 IAW 34SO-N61-001-2:
		  • 2N62-F085, Holdup Line Drain
		  • 2N62-F030A, Cndsr/Sep A Drain
		  • 2N62-F030A, Cndsr/Sep A Drain
		  • Reopens valves when pressure is <6 psig

		Simulator Operator: If sent as the SO to check on Steam Seal Feed Valve Controller air pressure, wait 2 minutes and report air inlet is 2 psig and air outlet is 0.5 psig.
		Simulator Operator, at the direction of the Chief Examiner, proceeds to next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 5 Page 13 of 33

Event Description: SRV 2B21-F013G opens. The SRV will close after the ATC depresses the LLS Reset PB IAW AB section.

Time	Position	Applicant's Actions or Behavior
8 min		*Simulator Operator: To insure the ATC operator gets the next malfunction, wait until the BOP is in the back panels OR as Shift Manger, request the BOP to get some back panel readings.* *Simulator Operator: When RWCU actions are complete and at the direction of the Chief Examiner, ACTIVATE: (**RB-6**)* • *svoB21220*
	All	• Recognize annunciators: • SAFETY BLOWDOWN VALVE LEAKING, (602-311) • SAFETY BLOWDOWN PRESSURE HIGH, (603-122)
		The ATC may enter the abnormal procedure first before addressing the ARPs.
	ATC	• Enters 602-311 and 603-122 annunciators • Confirms which safety relief valve has opened using the amber valve leakage indicator • Directs BOP to check back panel tail pipe temperatures • Reports to the SRO and ATC operator that "G" SRV is open
		*Simulator Operator: When the operator depresses the LLS pushbutton, ENSURE **ET-B21-15** activates.*
	ATC	• Enters 34AB-B21-003-2, Failure of Safety/Relief Valves • Confirms the green AND amber lights are illuminated for 2G SRV • Cycles the 2G SRV control switch several times between Open/Close • May depress the ADS Logic A Timer Reset pushbutton (2B21-S2A) • May depress the ADS Logic B Timer Reset pushbutton (2B21-S2B) • Depresses the LLS Channel A / C Reset pushbutton (2B21-S15A) • Depresses the LLS Channel B / D Reset pushbutton (2B21-S15B) (*Critical Task*) • Notifies SRO that SRV "2G" closed when LLS pushbutton is depressed.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 5 Page 14 of 33

Event Description: SRV 2B21-F013G opens. The SRV will close after the ATC depresses the LLS Reset PB IAW AB section.

Time	Position	Applicant's Actions or Behavior
		• Confirms that SRV 2G is closed by monitoring one or more of the following: • SRV tailpipe temperature decrease (Directs BOP to P614 panel) • Torus level stabilizing • Torus Temp stabilizing • Rx and Generator power returns to the pre-event level • Resets the SRV leak detection by placing the Leak Detection Logic A Reset keylock switch and Leak Detection Logic B Reset keylock switch to Reset position and back to Normal position • Confirms that the Amber SRV indicating lights have Extinguished • SAFETY BLOWDOWN PRESSURE HIGH, (602-311), clears • Informs the SRO that SRV 2G is closed.
	SRO/ATC	Informs the crew that operability of the suppression chamber-drywell vacuum breakers must be performed within 12 hours per 34SV-T48-002-2, Suppression Chamber To Drywell Vacuum Breaker System Operability. Notifies Chemistry and initiates a CR to initiate increased monitoring of vessel moisture content carryover per 64CH-SAM-025-0.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 5 Page 15 of 33

Event Description: SRV 2B21-F013G opens. The SRV will close after the ATC depresses the LLS Reset PB IAW AB section.

Time	Position	Applicant's Actions or Behavior
		*At this time, Torus temperature will still be below 95°F, therefore RHR is NOT required to be placed into Torus Cooling. The SRO may elect to place Torus Cooling in service, since steam was admitted to the Torus. The following steps are written **IF** the SRO elects to place Torus Cooling in service.*
		NOTE: *The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. The A or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "A" loop is used, substitute "A" for "B" for valves and if "B" pump is NOT used substitute "A", "C", or "D" for "B" pump.*
	BOP	• Enters 34SO-E11-010-2, Residual Heat Removal • Places RHRSW in service • Prelube RHRSW pump • Overrides 2E11-F068B Low Discharge Pressure Interlock • Positions 2E11-F068B to 45% OPEN • Receives alarm, RHR HX B DIFF PRESS LOW, (601-215) • Starts RHRSW pump B • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 gpm AND < 450 psig
	BOP	• IF desired to start a SECOND RHRSW pump, • Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM). • Opens 2E11-F068B an additional 5%. • Starts second RHRSW Pump. • Positions 2E11-F068B to obtain < 8800 gpm AND < 450 psig

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 5 Page 16 of 33

Event Description: SRV 2B21-F013G opens. The SRV will close after the ATC depresses the LLS Reset PB IAW AB section.

Time	Position	Applicant's Actions or Behavior
	BOP	• Places RHR B Loop in Torus cooling per the placard by performing the following steps: • Opens 2E11-F048B • Closes 2E11-F047B. • Opens 2E11-F003B. • Starts RHR Loop B pump • Receives alarm, RHR LOW FLOW, (601-222) • Opens 2E11-F028B • Receives alarm, AUTO BLOWDOWN CS OR RHR PRESS PERMISSIVE, (602-312) • Receives alarm, SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) • Throttles OPEN 2E11-F024B • Alarm, RHR LOW FLOW, (601-222), clears • Opens 2E11-F047B • Ensures RHR flow is < 11,500 GPM, THEN Closes 2E11-F048B • Notifies the SRO that RHR "B" loop is in service • May place the second pump in service.
		Simulator Operator, at the Chief Examiners direction, PROCEEDS to the next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 6 Page 17 of 33

Event Description: RWCU line will break outside of Primary Containment.

Time	Position	Applicant's Actions or Behavior
10 Mins		*Simulator Operator:* *When power is approximately 7%, AND at the direction of the Chief Examiner, Call the ATC and request the value for Off Gas flow. When the ATC is at 2N62-P600, ENTER malfunction mfG31_52 (**RB-5**).*
	ALL	Recognize RWCU SYS LEAK, (602-421) annunciator
		NOTE: *If 2G31-F004 is closed in a timely manner, the failure of the auto isolation may NOT be recognized.*
	BOP	Responds to RWCU SYS LEAK, (602-421) annunciator • Determines that an isolation is required and performs the following: • Confirms automatic actions by: • Tripping RWCU Pump "2B • Places control switch for 2G31-F001 to close (will NOT Auto close) • Places control switch 2G31-F004 to the close (Critical Task) • Enters 34AB-G31-001-2, RWCU System Isolation
		• Notifies SRO of conductivity monitoring requirements of TRM T3.4.1. • Notifies SRO of possible SC-Secondary Containment Control Entry
	BOP	• Notifies SRO of the failure of RWCU to isolate and that 2G31-F001 will NOT close. • Suspects a leak has occurred and enters 34AB-T22-001-2 "Primary Coolant System Pipe Break Reactor Building" • Informs ATC to monitor level and power

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 6 Page 18 of 33

Event Description: RWCU line will break outside of Primary Containment.

Time	Position	Applicant's Actions or Behavior
	BOP	Responds to RWCU DISCH PRESS HIGH/LOW, (602-409) alarm.
		• Since RWCU System has isolated, STOPS blow down operations by closing the following valves on 2H11-P602: • 2G31-F033 • 2G31-F034 • 2G31-F031
	SRO	• Dispatches SO to determine RWCU leak location. • Dispatches SO/Maintenance to determine why: • 2G31-F001 and F004 did NOT auto close. • 2G31-F001 did NOT manually close. • Enters TS for 2G31-F001. • Determines that LCO 3.6.1.3.A.1 and A.2 applies and the RWCU Line must be isolated within 4 hours and verified closed every 31 days. • May request SSS to draft a Danger Tagout for 2G31-F001. • Enters TRM for continuous conductivity monitoring • Determines that TSR 3.4.1.1 requires 24 hour surveillance requirement if switch NOT placed in Reactor Water position on 2H11-P602. • Reviews EOP SC for possible entry conditions
		Simulator Operator, at the direction of the Chief Examiner, proceeds to next event.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 7 Page 19 of 33

Event Description: Inadvertent Group 1 and ATWS

Time	Position	Applicant's Actions or Behavior
8 Mins		*Simulator Operator: At the direction of the Chief Examiner, activate: (**RB-7**)* • *mfB21_247A* • *mfB21_247B*
	ALL	Recognizes annunciators and plant conditions: • Group 1 System A/B Trip – Full Group 1, MSIV isolation • Reactor Auto Scram System A/B Trip – Full reactor scram required
	SRO	• Assigns the ATC to perform RC-1. • Assigns the BOP operator to perform RC-2 and RC-3. • If time allows assigns TC-1 to be performed. • Enters the RCA EOP flow chart, 31EO-EOP-011-2, for a scram condition and reactor power above 5%. • Enters CP-3 EOP flow chart, 31EO-EOP-017-2, for ATWS level control.
	ATC/BOP	Places MSIV switches to close on 2H11-P602 and P601 panels.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8 Page 20 of 33

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
	ATC	• Performs RC-1 consisting of: • Inserts a manual scram. • Places the mode switch to shutdown. • Attempts to confirm all rods are inserted by observing full in lights, SPDS, or the RWM display. • Notifies the SRO that control rods are out • Places SDV isolation valve switch to "isolate" & confirms closed. • Trips Recirc Pumps (power >5%) • Inserts SRMs and IRMs.
	ATC	• Injects SBLC (power >5%) • Unlocks and places SBLC pump select switch in "Start Sys A" or "Start Sys B" position. • Confirms Squib Valve Ready Lights are extinguished. • Confirms SBLC Loss of Continuity to Squib Valve annunciator is alarmed. • Recognizes that the selected SBLC pump DID NOT start. • Places SBLC pump select switch in "Start Sys B" or "Start Sys A" position. (The pump NOT attempted first.) • Recognizes that the selected SBLC pump DID NOT start. • Confirms closed 2G31-F004, RWCU Isolation Valve, (Valve was previously closed, due to RWCU leak).
		Simulator Operator, when directed, after 3 minutes, NOTIFIES the ATC that jumper installation is complete for 31EO-EOP-100-2.
	ATC	• Directs SSS to perform 31EO-EOP-100-2 for SBLC Pump Control Switch Override. • Reports to SRO failure of SBLC to inject from control room and local initiation IAW 34SO-C41-003-2 is required.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8 Page 21 of 33

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
	ATC	Directs SO to manually initiate SLC locally IAW 34SO-C41-003-2.
		Simulator Operator: When called as the SO and SLC initiation, acknowledge the communication. If called again, say that you are working on it and will call when completed. ***NOTE:*** *With MSIV closure, checking of ECCS is the only pertinent RC-2 action.*
	BOP	• Performs RC-2 by checking status of ECCS systems.
		• Performs RC-3 consisting of: • Monitor RPV pressure. • Confirm proper operation of pressure control system (LLS and SRVs). • If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS. • Maintain RPV pressure between 1074 and 800 psig. • Notify SRO that LLS is the pressure control system.
	SRO	• Directs ATC to: • Confirm the reactor Mode Switch in Shutdown. • Confirm ARI Initiation.
	ATC	• Reports to the SRO that: The Reactor Mode Switch is in the Shutdown position. • ARI has been initiated (ATC may initiate ARI at this time) • Recirc is at minimum speed or tripped if power > 5%.
	SRO	• Directs ATC or STA to report reactor power or observes reactor power on SPDS. • Directs ATC to Reset ARI and insert control rods IAW 31EO-EOP-103-2, EOP Control Rod Insertion Methods.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
		NOTE: *If asked, STA will direct the ATC to start in the center of the core and spiral out in a "black and white" pattern.*

	ATC	• Enters 31EO-EOP-103-2, EOP Control Rod Insertion Methods, section 3.7, Driving Control Rods at panel 2H11-P603.
		• Confirms ARI initiation signals are clear and Then depresses ARI Reset pushbutton OR dispatches an operator to place ARI System Test switch, to TEST, on panel 2C11-P001
		• Check annunciator ARI INITIATED, clear
		• Attempts to drive rods by:
		  • Places Reactor Mode switch to REFUEL.
		  • Places Rod Worth Minimizer bypass switch to BYPASS.
		  • Obtain recommendations from STA
		  • Verifies adequate CRD drive water pressure for driving rods and may operate 2C11-R600, CRD Flow Control, to achieve higher drive water DP.
		  • May start second CRD pump
		  • Drive rods to at least 02 using the Emerg In or IN (Critical Task)

		CONTINUOUS RECHECK: ***Simulator Operator, when the following conditions exist:*** 1. ***Scram is RESET,*** 2. ***RWL is controlled between -60 and -90 inches,*** 3. ***At least one loop of RHR is in Torus Cooling,*** 4. ***WITH CHIEF EXAMINERS DIRECTION,*** ***DELETES mfC11_211.***

	ATC	• Enters 31EO-EOP-103-2, EOP Control Rod Insertion Methods, section 3.3, Repeating Manual Scram at panel 2H11-P603.
		  • Bypasses scram discharge volume high level trip at 2H11-P603.
		  • Dispatches operator to install jumpers to override all automatic scram signals.
		  • Places Discharge Volume Isolation Test switch to Norm at 2H11-P603.
		  • Resets Scram when notified that jumpers have been installed.
		  • Confirm all SDV Vent and Drain Valves are open.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
		NOTE: *2C11-R607, Press Control Vlv F127, controller is failed to allow only ~25% valve position. A valve position of 25% will NOT allow control rods to insert from Cooling Water DP.*
		• Enters 31EO-EOP-103-2, EOP Control Rod Insertion Methods, section 3.8, Increasing CRD Cooling Water Dp at panel 2H11-P603. • Places 2C11-R607, Press Control Vlv F127 Controller, in MAN • Increases output of 2C11-R607 to 100% at 2H11-P603 • Confirms open OR fully opens 2C11-F003 • Places 2C11-R600, CRD Flow Control, in MANUAL • Increases output of 2C11-R600 to 100% • Closes 2C11-F005, Return To Vessel Flow Control
		NOTE: *If mfC11_211 has NOT been deleted, then the operator will perform the following step multiple times. Check with Chief Examiner for DELETING this malfunction.*
	ATC	• When one of the following alarms clears, inserts a manual scram: • SCRAM DISCH VOL HIGH LEVEL TRIP, (603-101) • SCRAM DISCH VOL NOT DRAINED, (603-119) • Notifies SRO that all rods are IN
	BOP	• As time allows, performs TC-1 • Confirm Trip of the Turbine. • Confirm TSV's, TCV's, and CIV's have properly closed. • Confirm/Place TGM in auto. • Start TG Oil Pump • Motor Suction Pump • Lift Pumps
	SRO	Directs an operator to "INHIBIT ADS"

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8 Page 24 of 33

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	• 2H11-P602, Places the following switches to INHIBIT: • ADS Channel A / C Auto Logic Inhibit switch (2B21C-S7A) • ADS Channel B / D Auto Logic Inhibit switch (2B21C-S7B)
	SRO	• Directs BOP control RWL -60 inches to -90 inches. • As time allows, directs BOP to verify Isolations and ECCS initiations.
	BOP	Reports failure of HPCI and RCIC to auto initiate at –35".
	BOP	• Reduces injection to control RWL -60 inches to -90 inches. • If HCPI was manually started, the operator will reduce controller output to lower RWL. • If HCPI was in standby, places 2E41-C002-3, HPCI Aux. Oil Pump, in PULL-TO-LOCK. • If RCIC were manually started, the operator may depress the RCIC turbine trip push-button or reduce controller output.
	BOP	Controls RWL -60 inches to -90 inches.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8 Page 25 of 33

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior

	BOP	IF RCIC injection is attempted **AND** RCIC was manually tripped:
		• IF RWL is <-35 inches, recognizes and informs the SRO that RCIC failed to auto start
		• Transfers 2E51-R612, Turbine Controller, to manual and adjust output to 50%.
		• Closes 2E51-F524, Trip & Throttle Valve.
		• Opens 2E51-F045, Stm to Turb Valve.
		• Opens 2E51-F046, Turb Clg Water Valve.
		• Starts 2E51-C002-2, Barom Cndsr Vac Pump.
		• Throttle opens 2E51-F524, Trip & Throttle Valve, AND concurrently opens 2E51-F013, Pump Discharge Valve
		• Confirms 2E51-F019, Min Flow Valve, Opens, AND subsequently closes, when system flow is greater than 79.3 gpm.
		• Continues to throttle 2E51-F524 Open, until turbine speed is limited by 2E51-R612, Turbine Controller, then perform the following:
		  • Fully opens 2E51-F524, Trip & Throttle Valve.
		  • Increases 2E51-R612, Turbine Controller, output to achieve 3000 to 4000 rpm.
		  • Transfers 2E51-R612, Turbine Controller, to auto and adjust to desired flow rate.
		• Maintains level –60" to –90"

	BOP	IF RCIC injection is attempted and RCIC has **NOT** been tripped: • Depresses RCIC Manual Initiation P/B (failed) • Opens 2E51-F046 • Starts Barom Cndsr Vac Pmp • Opens 2E51-F045 • Confirms open 2E51-F019 • Confirms closed 2E51-F019 at flow > 79.3 gpm • Opens 2E51-F013 • Adjusts controller for desired flow • Maintains level –60" to –90"

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8 Page 26 of 33

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
	BOP	If HPCI injection is attempted the operator: • IF RWL is <-35 inches, recognizes and informs the SRO that HPCI failed to auto start • Opens 2E41-F059, Lube Oil Clg Wtr Valve. • Starts 2E41-C002-2, Barom Cndsr Vacuum Pump. • Opens 2E41-F001, Turb Steam Supply Valve. • Take 2E41-C002-3, Aux Oil Pump, control switch to the START position. • Open 2E41-F006, Pump Discharge Valve. • Confirm 2E41-F012, Min Flow Valve, CLOSES at flow > 790 gpm.
		NOTE: *With an initial Torus temperature of 86 deg F., after the Group 1 isolation and without rod insertion or Torus Cooling, it takes ~ 6 minutes for Torus temperature to reach 100 deg F.*
	BOP	• As time allows, enters 34AB-T23-003-2, Torus Temperature Above 95°F • Confirms the high temperature by observing the Suppression Pool bulk average temperature on the SPDS primary display • Places RHR in Suppression Pool cooling per 34SO-E11-010-2, Residual Heat Removal.

	SRO	Enters EOP PC chart on a Torus Temperature of 100 deg F and directs BOP:
		• Place all available Torus Cooling in service
		• To monitor:
		  • Torus Temp
		  • Torus Level
		  • Drywell Temp
		  • Containment Pressure
		• As time allows, place Hydrogen and Oxygen analyzers in service IAW 34SO-P33-001-2.

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
		NOTE: The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used. *The A or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "A" loop is used, substitute "A" for "B" for valves and if "B" pump is NOT used substitute "A", "C", or "D" for "B" pump.*
	BOP (Placard)	• Enters 34SO-E11-010-2, Residual Heat Removal or uses placard on 2H11-P601. • Places RHRSW in service • Prelubes RHRSW pump • Overrides 2E11-F068B Low Discharge Pressure Interlock • Positions 2E11-F068B to 45% OPEN - RHR HX B DIFF PRESS LOW, (601-215) alarms • Starts RHRSW pump B • Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position. • Positions 2E11-F068B to obtain < 4400 GPM AND < 450 PSIG • RHR HX B DIFF PRESS LOW, (601-215) alarm clears
	BOP (Placard)	• Place RHR loop B in Suppression Pool Cooling • Does NOT position the 2/3 Core Height Permissive switch. (RWL will NOT be lowered to below 2/3 core height) • Does NOT place the Containment Spray valve Control switch in the manual position. (LOCA signal is NOT present) • Confirm open 2E11-F048B, HX Bypass Vlv. • Close 2E11-F047B, Hx Inlet Vlv. • Confirm open 2E11-F003A, HX Outlet Vlv • Start "2B RHR pump - SEC SYSTEM AUTO INITIATION SIGNAL PRESENT, (650-234) alarms - AUTO BLOW DOWN CS OR RHR PRESS PERMISSIVE, (602-312) alarms - RHR FLOW LOW, (601-215) alarms

Op-Test No.: 2013-301 **Scenario No.:** 8-06 **Event No.:** 8

Event Description: RCIC/HPCI Failures and ATWS

Time	Position	Applicant's Actions or Behavior
	BOP (Placard)	• Open 2E11-F028B, Torus Spray or Test Vlv. • Throttle open 2E11-F024B, Full Flow Test Line Vlv. and establish RHR flow of less than or equal to 7700 gpm (R603B) - RHR Flow Low (601-215) alarm clears • Open 2E11-F047B, Hx Inlet Vlv. • Close 2E11-F048B, Hx Bypass Vlv. • Reports to SRO that RHR has been placed in Suppression Pool Cooling mode.
		Simulator Operator *With Chief Examiner's permission Scenario will stop here.*

NRC DRAFT

Scenario Summary

Facility: E. I Hatch **Scenario No.:** 8-06 **Op-Test No.:** 2013-301

Initiating Conditions:	Unit 2 is operating at approximately 7% RTP preparing to swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2.
Turnover	Continue startup IAW 34GO-OPS-001-2, Plant Startup, starting at step 7.3.22 to increase pressure set to 920 psig. Once complete pull rods to increase reactor power to 9% RTP in preparation of transferring the mode switch to Run.

Summary:

- **Event 1**: Swap Steam Packing Exhausters IAW 34SO-N33-001-2.
- **Event 2**: Pull control rods to continue Startup to ~ 9% power, raise pressure set to 920.
- **Event 3**: IRM "A" fails upscale. Control rod 30-03 has a blown RPS fuse in "B" logic train so when the "A" RPS trip occurs, the rod scrams full-in. The crew must address the control rod drift annunciator and the mis-positioned control rod abnormal procedure. After the control rod fuse, the rod is withdrawn to the pre-event position. The SRO will address Tech Specs 3.1.6 for Rod Pattern Control.
- **Event 4:** Component; The main turbine Gland Seal Regulator valve will fail closed while in chest warming. The operator will take manual actions to restore the steam seal header pressure to normal.
- **Event 5:** Component/TS; SRV "2G" opens. The ATC operator will attempt to close the SRV IAW the abnormal procedure for an electrically open SRV. After the ATC operator cycles the SRV control switch, the SRV will close. **(Critical task)**. If Torus temperature exceeds 95°F, the BOP operator will place RHR in Suppression Pool Cooling. SRO addresses TS for inoperable SRV.
- **Event 6**: Component/TS; A RWCU line will break outside of Primary Containment. The inboard and outboard isolation valves fail to close automatically. The operator will take manual actions to isolate the leaking RWCU line. **(Critical Task)** The SRO addresses Tech Specs for inoperable Primary Containment Isolation Valves.
- **Event 7:** Major; Inadvertent Group 1 isolation causes MSIVs closure. An ATWS condition will exist, requiring the ATC operator to manually insert control rods. **(Critical task)**
- **Event 8:** Component; Both SBLC pumps will fail to start from the control room. The operator will take manual actions to inject SBLC locally.
- **Event 9:** Component; RCIC and HPCI fail to auto start. RCIC must be manually aligned and started to maintain RWL –60" to –90".

NRC DRAFT

Critical Task List

Facility: E. I Hatch **Scenario No.:** **8-06** **Op-Test No.:** 2013-301

Critical Tasks

- Cycles the SRV control switch to close SRV. **(Event 5)**
- Manually isolate RWCU before exceeding maximum safe Secondary Containment Control EOP parameters (Temperatures, Radiation levels or SC water levels). **(Event 6)**
- Commence insertion of control rods within 20 minutes and before entering the unsafe region of the Heat Capacity Temperature Limit graph. **(Event 7)**

	ES 301-4 Attributes	Required	Actual	Items
1.	Total Malfunctions	5-8	7	1. Control rod scrams in (**Event 3)** 2. Gland Seal Regulator valve fails **(Event 4)** 3. SRV "2G" begins leaking **(Event 5)** 4. RWCU line break outside of Primary Containment **(Event 6)** 5. Inadvertent Group 1 on low vacuum along with an ATWS **(Event 7)** 6. Both SBLC pumps will fail **(Event 8)** 7. RCIC and HPCI fail to auto start. **(Event 9)**
2.	Malfunctions After EOP Entry	1-2	2	1. Both SBLC pumps will fail **(Event 8)** 2. RCIC and HPCI fail to auto start. **(Event 9)**
3.	Abnormal Events	2-4	2	1. SRV "2G" begins leaking **(Event 5)** 2. RWCU line break outside of Primary Containment **(Event 6)**
4.	Major Transients	1-2	1	1. Inadvertent Group 1 on low vacuum along with an ATWS **(Event 7)**
5.	EOPs entered, requiring substantive actions	1-2	2	1. EOP RCA (ATWS) 2. EOP CP-3
6.	EOPs contingencies requiring substantive actions	0-2	1	1. EOP CP-3
7.	Critical Tasks	2-3	3	1. Uses SRV switch to close SRV **(Event 5)** 2. Manually isolate RWCU **(Event 6)** 3. Insert Rods during ATWS **(Event 7)**

SHIFT TURNOVER

target ZERO Every day, every job, safely.	**Safety Focus**
UNIT 1 STATUS	
Plant Conditions:	Unit 1 is operating at 100% power Activities in progress: Maintaining Rated Thermal Power
UNIT 2 STATUS	
Plant Conditions:	Unit 2 is operating at approximately 7% RTP preparing to swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2. Activities in progress: Continue with startup IAW 34GO-OPS-001-2, Plant Startup, starting at step 7.3.22 to increase pressure set to 920 psig. Once complete, pull rods to increase reactor power to 9% to transfer the mode switch to Run.

Protected Train:	**EOOS:**	
☒ Division I	☒ Green	☐ Orange
☐ Division II	☐ Yellow	☐ Red

Scheduled evolutions:	☐ Swap Steam Packing Exhausters per step 7.3.1 of 34SO-N33-001-2. ☐ Increase pressure set to 920 psig per step 7.3.22 of 34GO-OPS-001-2, Plant Startup. ☐ Once complete pull rods to increase reactor power to 9% RTP for transferring the mode switch to Run.
Surveillances due this shift:	☐ None
Inop Equipment:	☐ None
Active tagouts:	☐ None
Rod Configuration:	See RWM

A) Reason for mispositioned control rod(s):

SCRAM ☒ DRIFT ☐ UNKNOWN ☐

OTHER ☐ _____ JAT

B) Length of time rod(s) misaligned:

20 Minutes JAT

C) Contact Reactor Engineering to determine what thermal limits were experienced during the event AND what recovery actions are necessary. JAT

D) IF thermal limits were exceeded during the event, an Engineering Evaluation will be required prior to recovery and/or resumption of full power operation to determine whether fuel safety limits were violated. Contact SNC Core Analysis for this evaluation.

Evaluation Required?

YES ☐ Attached NO ☒ JAT

E) Power level at which recovery is to be performed: 8 % Power JAT

F) Control rod movement recovery rate:

NOTCH ☐ CONTINUOUS ☒ VARIABLE ☐ JAT

G) Movement of other rods/groups to support recovery actions required:

YES ☐ NO ☒

H) Individual control rod requires bypassing in RWM:

YES ☐ (refer to Attachment 3.) NO ☒ JAT

Approvals for bypassing rod in RWM:

John A. Thomas STA/RE Jack R. Hurn SM

I) Other instructions for recovery: IAW 34GO-OPS-065-0, step 7.3.2.6 to 7.3.2.8, bypass RWM. Unbypass RWM after recovery actions are complete. Ensure administrative procedure compliance.

CONTROL ROD LOCATION	RWM		CONTROL ROD POSITION ING					DOUBLE VERIF BY:
	ROD BYPASSED BY:	ROD UNBYPASSED BY:	AS FOUND POSITION	INTER-MEDIATE POSITION	AS LEFT POSITION	ROD MOVED BY:	COUPLING CHECK BY:	
30-03	**N/A**	**N/A**	**00**		**48**			
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